PROPERTY OF
L.F. BLANKENSHIP.
3924 MEADE ST.
DENVER, COLORADO

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Admiral	Ch. 20SY4BF, E, EF, ES, F, FF, L, LF, LS, Tel. Rec.	326-2
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Andrea	C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21 (Ch. VP21) Tel. Rec.	326-4
Coronado	RA33-8115A	326-5
Coronado	TV1-9320A, TV1-9330A, TV1-9332A Tel. Rec.	326-6
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Silvertone	2014, 2015, 2016, 6014, 6015, 6016 (Ch. 132.40500)	326-13
Zenith	Royal 500 (Ch. 7XT40)	326-14

Admiral 1824 ESA
1524 PSA

326-155

Admiral 1723 J - JC - JT

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7 IN SET 292

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General Electric models 21C40, 21C130, 21C131, 21C151, 21C152, 21C156, 21C157 ("0" line) were covered in Photofact Folder 7 – Set 292.

Models 21C128, 21C129, 21T029 and 21T030 are added, along with late production changes, with the publication of this bulletin.

VERTICAL OSCILLATOR AND OUTPUT CIRCUIT REVISED

Early production receivers employ the circuit shown on page 2 of the original photofact folder.

Late production receivers utilize a new vertical output circuit. A partial schematic is given in Fig. 1 showing the revised circuit.

The latest production receivers employ a blocking oscillator type circuit. This type circuit eliminates the sync amplifier (V12A). The triode section of V12A is then used as the vertical oscillator. V8 (vertical multivibrator and 2nd sound IF) is removed completely with V8A (2nd. sound IF) being replaced by a 6AU6. A partial schematic showing the new vertical circuit is given in Fig. 2.

POWER TRANSFORMER REVISED

The tap on the primary of the power transformer (T1) was removed early in production. At the same time the line fuse (M1) and its terminal board were also omitted.

NEW YOKE PLUG

Late production receivers use a 4 pin yoke plug in place of the 12 pin used originally. A partial schematic is given in Fig. 3 showing the correct wiring arrangements.

COMPONENT CHANGES

R31 is omitted.

R38 is decreased from 5.1KΩ to 4.7KΩ.

R100 is increased from 560KΩ to 680KΩ.

A 5.6KΩ resistor is added in series with the horizontal hold control (R6) and ground.

R74 is omitted.

R112 is increased from 1Meg to 2.2Meg.

On late production models the switch on the area control (R3) is omitted.

R54 is decreased from 100KΩ to 82KΩ.

R121 may be replaced by two 15KΩ resistors connected in parallel.

Late production models use miniature sound IF and ratio detector transformers. L39 is changed to part #RTL-178. L40 is changed to part #RTD-022.

The 1st. sound IF stage is revised. A partial schematic is given in Fig. 4 showing the new circuit.

The antenna attenuator switch (M6) is omitted in late production receivers.

PRODUCTION CHANGES
BULLETIN 163

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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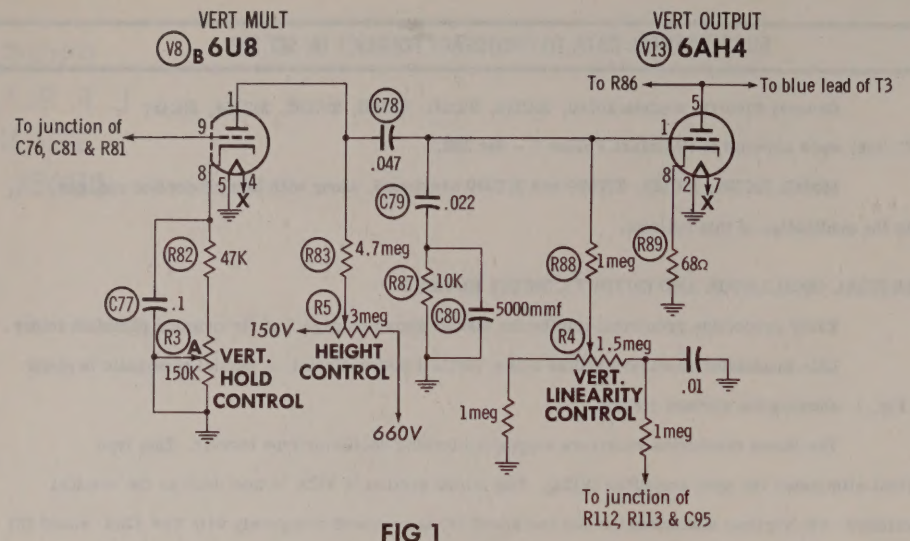


FIG 1

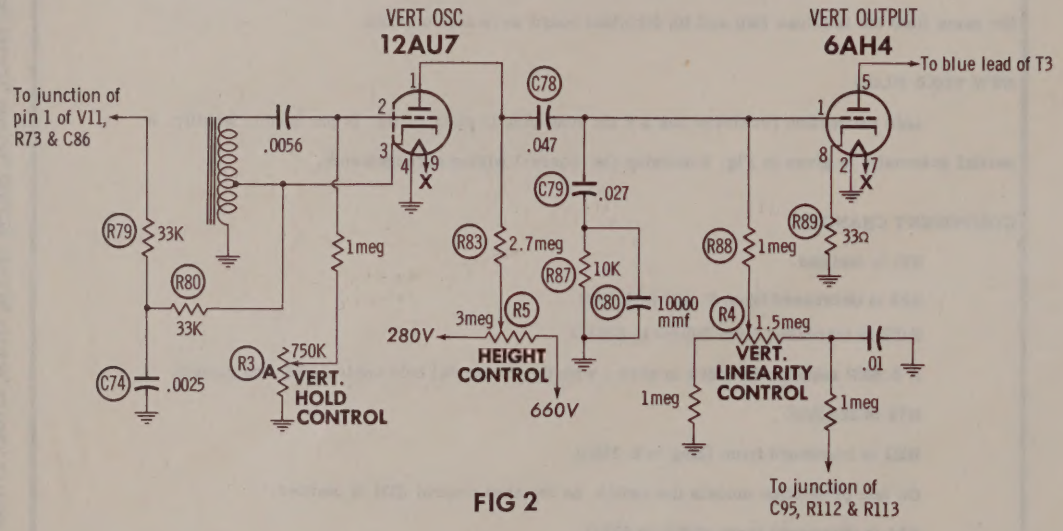


FIG 2

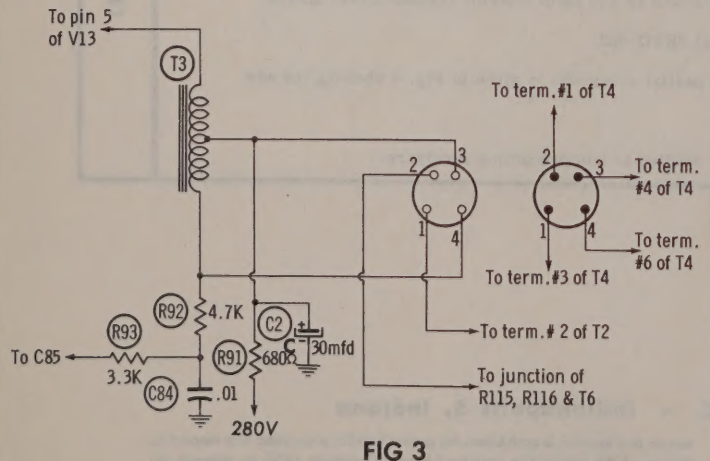


FIG 3

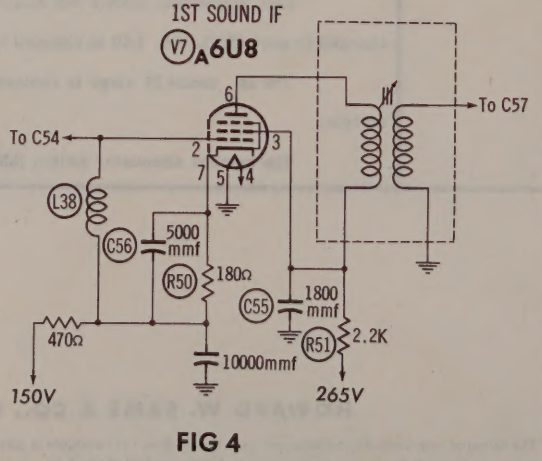


FIG 4

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 225

ALLSTATE MODELS 6286(Ch. 528.6286-6), 6287(Ch. 528.6287-6)

Allstate models 6286-4 (Ch. 528.6286-4) and 6287-4 (Ch. 528.6287-4) were covered in Photofact Folder 3 – Set 225.

Models 6286 (Ch. 528.6286-6) and 6287 (Ch. 528.6287-6) are electrically identical to the models covered, except for the following changes.

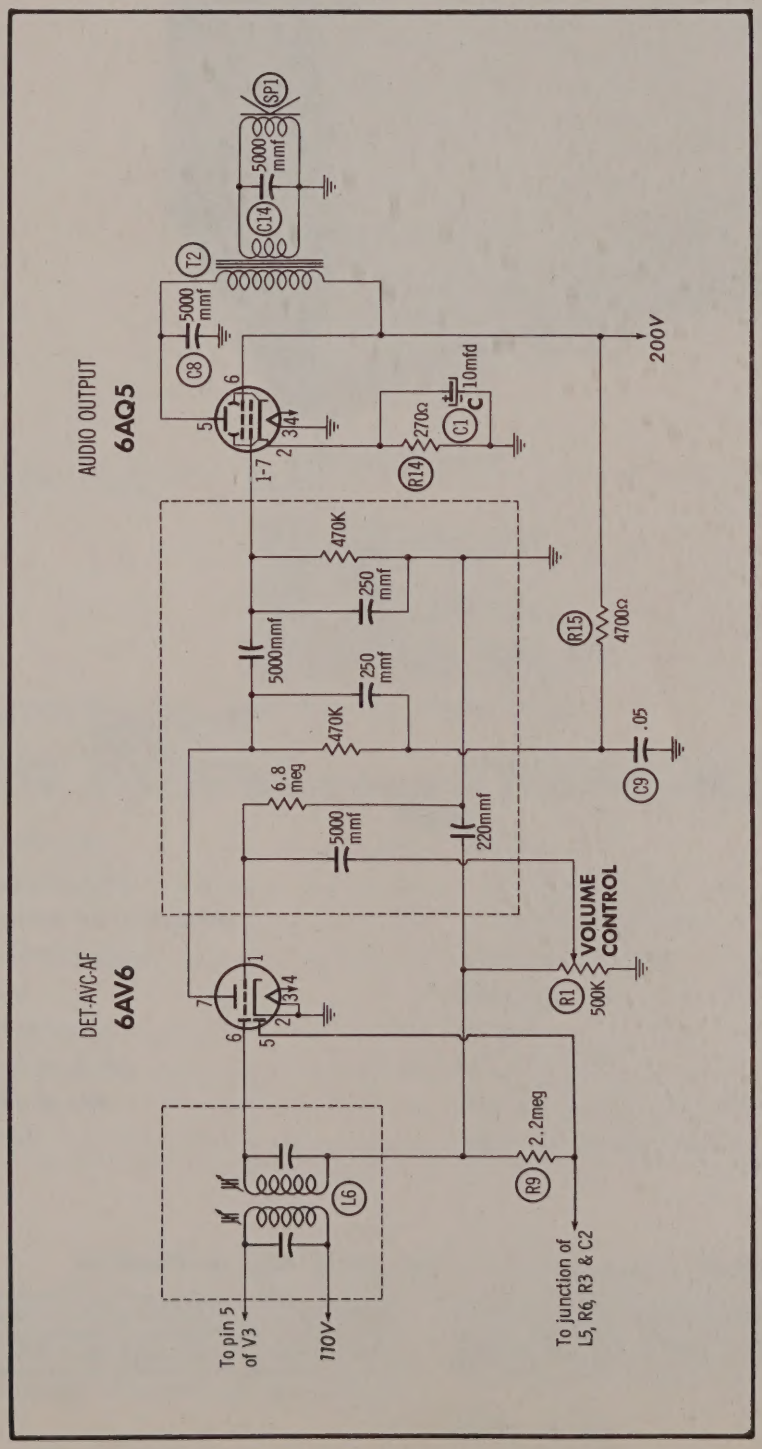
C8 is increased from a 5000MMF to a .01MFD.

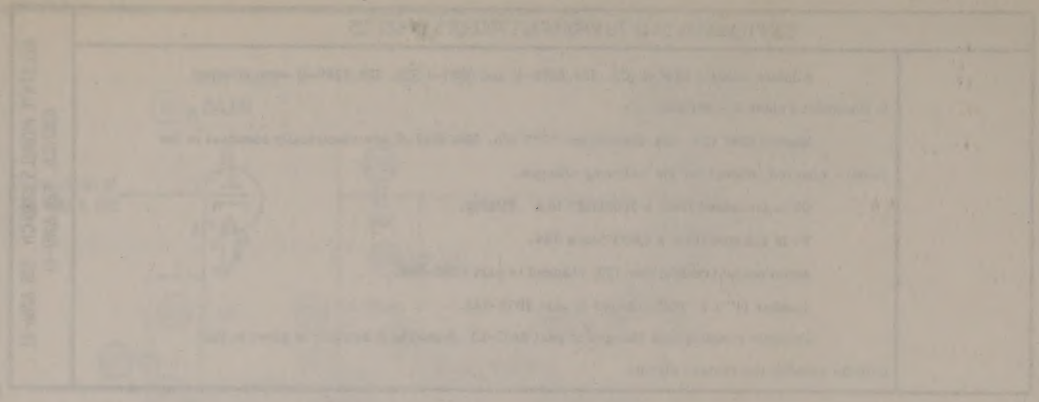
V6 is changed from a 6X5GT to a 6X4.

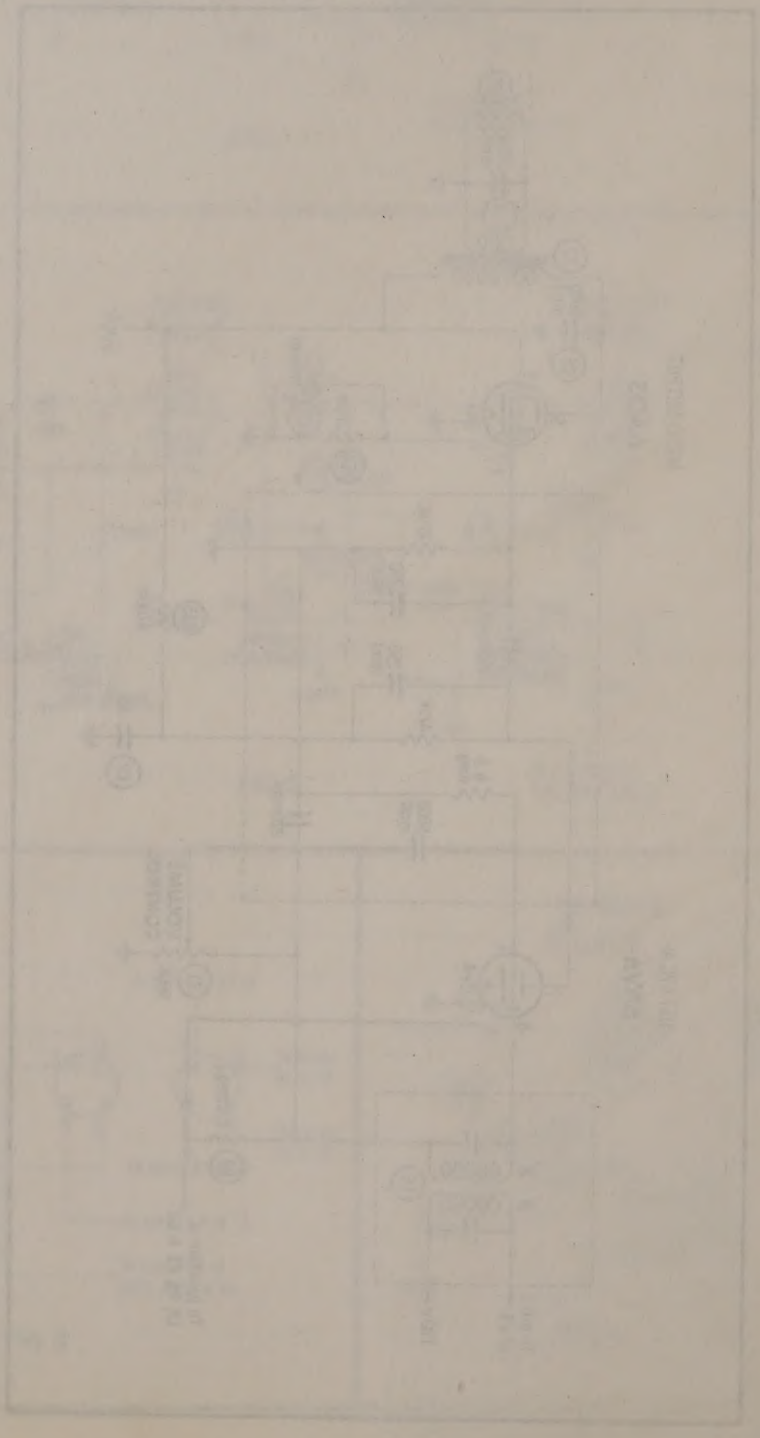
Audio output transformer (T2) changed to part #B80-304.

Speaker (4" x 6" PM) changed to part #B79-422.

Ceramic coupling unit changed to part #A17-111. A partial schematic is given in this bulletin showing the revised circuit.







ADMIRAL CHASSIS 20SY4BF, E, EF, ES, F, FF, L, LF, LS

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DENVER, COLORADO

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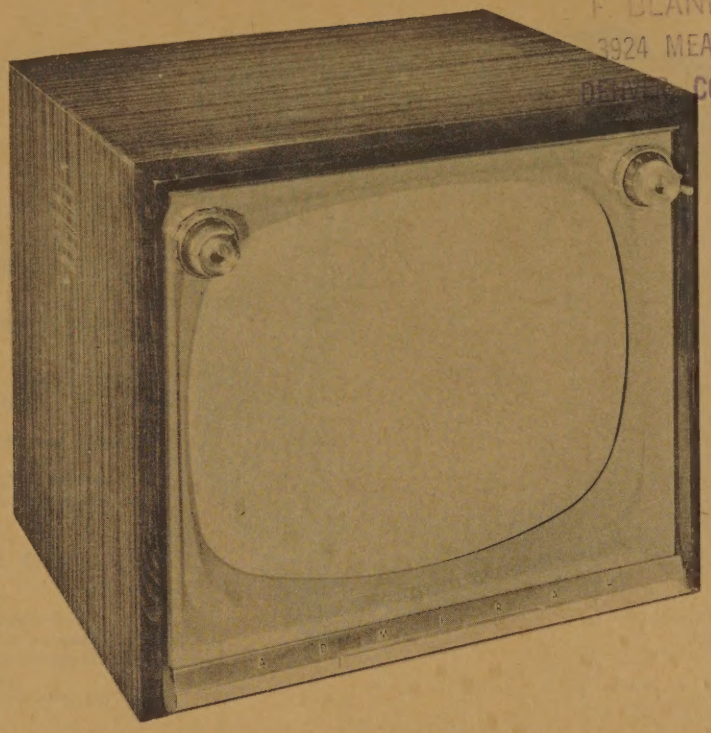
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



ADMIRAL MODEL TS23B6N

TRADE NAME	Admiral	MODELS	CHASSIS
		TS23B16, TS23B17	20SY4BF
		CS23B1, CS23B2, CS23B3, CS23B16, CS23B17, CS23B26, CS23B27	20SY4E, 20SY4EF
		CS23A6, CS23A7	20SY4EF
		CS23A1W, CS23A2W, CS23A3W	20SY4ES
		CS25B6, CS25B7, CS25B16, CS25B17	20SY4F, 20SY4FF
		TS23B26, TS23B27	20SY4L, 20SY4LF
		TS23B1, TS23B2, TS23B6, TS23B6N, TS23B7	20SY4L, 20SY4LS
		TS2301DRW, TS2302DRW, TS2303DRW	20SY4LS

MANUFACTURER Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET Television Receiver
TUBES Twenty-one
POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.6 Amp. @ 117 Volts AC
TUNING RANGE Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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Servicing in the Field 1
Schematic 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

ADMIRAL CHASSIS 20SY4BF, E, EF, ES, F, FF, L, LF, LS

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type control knobs from front panel of cabinet.

2. Remove 10 wood screws. Remove rear cover.

3. Remove picture tube socket, ion trap, HV lead, speaker plug, yoke plug, 2 control assembly plugs and dial light plug.

4. Remove 12 wood screws from 3 corner braces at the rear of cabinet.

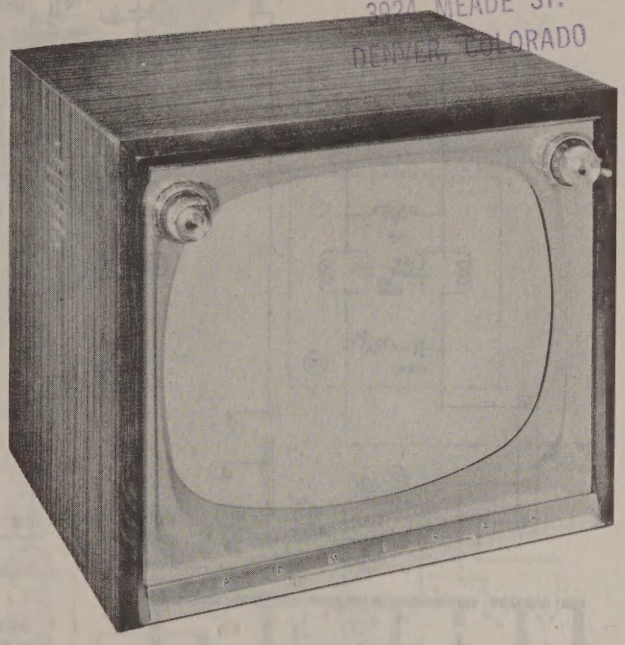
5. Remove 2 wood screws from AC interlock bracket and 2 wood screws from antenna terminal bracket.

6. Remove 4 chassis bolts. Remove chassis from cabinet.

7. Remove 2 screws holding control assembly bracket to cabinet inside, also unclip on/off volume - contrast control assembly from inside of cabinet.

8. Remove 2 metal screws holding speaker. Remove speaker from cabinet.

NOTE: If it is necessary to remove the chassis for servicing, it is also necessary to remove the speaker. The audio output transformer is mounted on the speaker and must be connected for proper operation.



MODEL TS23B6N

ADMIRAL CHASSIS 20SY4BF, E, EF, ES, F, FF, L, LF, LS

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 5 push-on type control knobs. Remove 4 wood screws holding molding at the top edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator may be made by adjusting the flexible shaft at the back of the set. Turn the horizontal adjustment slug until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate "Sound IF Detector Buzz" adjust the ratio detector secondary (L23) located on the rear of the chassis.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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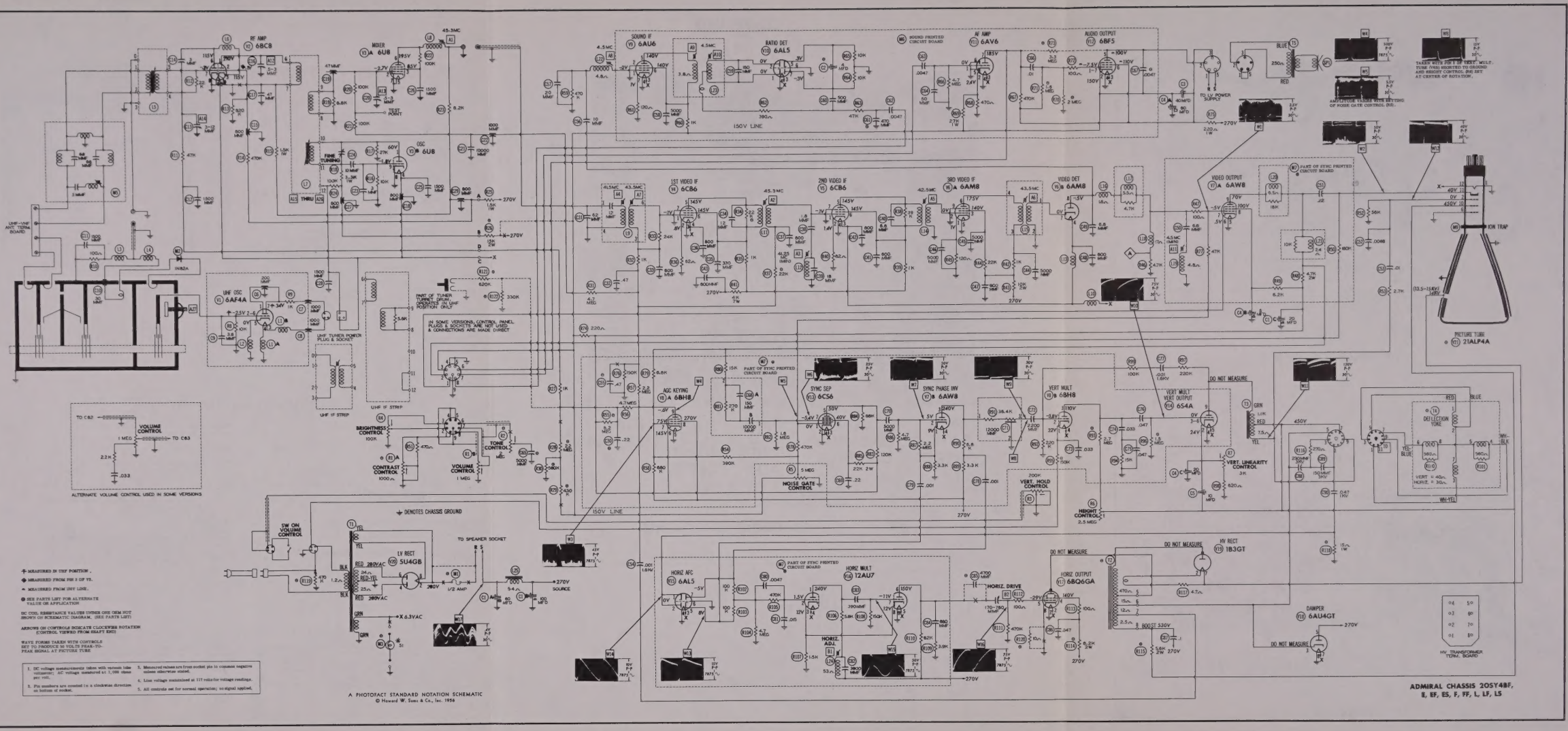
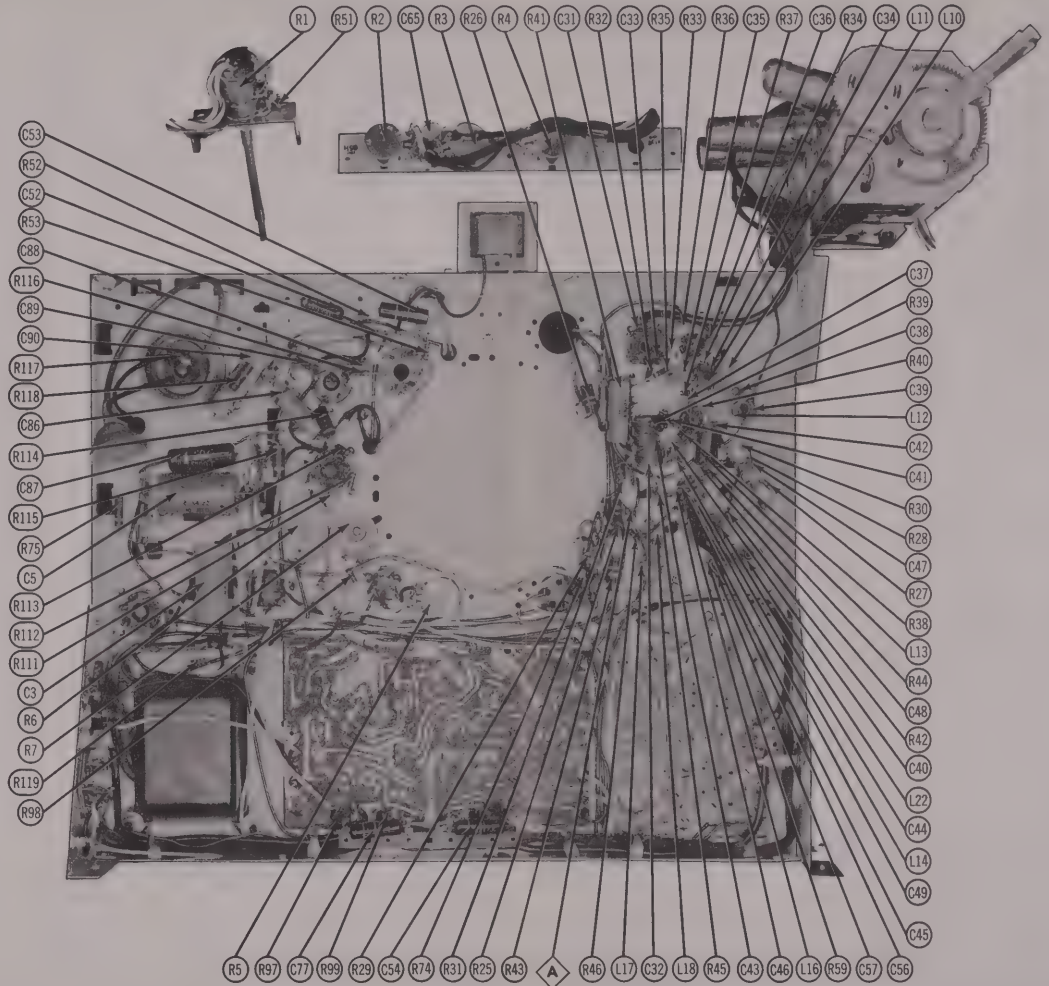

ADMIRAL CHASSIS 20SY4BF,
E, EF, ES, F, FF, L, LF, LS
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1956
DENOTES CHASSIS GROUND
150V LINE
270V LINE
ALTERNATE VOLUME CONTROL USED IN SOME VERSIONS
IN SOME VERSIONS, CONTROL PANEL PLUGS & SOCKETS ARE NOT USED & CONNECTIONS ARE MADE DIRECT
PART OF TUNER TURRET DRUM, OPERATES IN UHF POSITION ONLY
TO SPEAKER SOCKET
TO LV POWER SUPPLY
DO NOT MEASURE
PICTURE TUBE
21ALP4A
ION TRAP
DAMPER
6AU4GT
HV RECT
1B3GT
HV TRANSFORMER TERM. BOARD
DEFLECTION YOKE
VERT. LINEARITY CONTROL
VERT. HOLD CONTROL
HEIGHT CONTROL
2.5 MEG
VOLUME CONTROL
1 MEG
BRIGHTNESS CONTROL
100K
CONTRAST CONTROL
1000
TONE CONTROL
SW ON VOLUME CONTROL
NOISE GATE CONTROL
5 MEG
HORIZ. ADJ.
HORIZ. DRIVE
HORIZ. HOLD CONTROL
200K
VERT. HOLD CONTROL
VERT. MULT. TUBE (T10) RESISTED TO GROUND AND BRIGHT CONTROL (R4) SET AT CENTER OF ROTATION.
AMPLITUDE VALUES WITH KEYING OF NOISE GATE CONTROL (R5).
TUNER
UHF OSC
6AF4A
UHF TUNER POWER PLUG & SOCKET
UHF IF STRIP
UHF-VHF ANT. TERM. BOARD
IN82A
RF AMP
6BC8
MIXER
6U8
OSC
6U8
1ST VIDEO IF
6CB6
2ND VIDEO IF
6CB6
3RD VIDEO IF
6AM8
VIDEO DET
6AM8
VIDEO OUTPUT
6AW8
SOUND IF
6AU6
RATIO DET
6AL5
AF AMP
6AV6
AUDIO OUTPUT
6BF5
AGC KEYING
6BH8
SYNC SEP.
6CS6
SYNC PHASE INV
6AW8
VERT MULT
6BH8
VERT MULT
VERT OUTPUT
6S4A
HORIZ AFC
6AL5
HORIZ MULT
12AU7
HORIZ OUTPUT
6BQ6GA
LV RECT
5U4GB
AUDIO OUTPUT
6AQ5
PART OF SYNC PRINTED CIRCUIT BOARD
SOUND PRINTED CIRCUIT BOARD
PART OF VIDEO PRINTED CIRCUIT BOARD
45.75MC
45.3MC
43.5MC
42.5MC
41.25 (MIN)
4.5MC (MIN)
4.5MC
4.8MC
3.8MC
MEASURED IN UHF POSITION.
MEASURED FROM PIN 3 OF V5.
MEASURED FROM 150V LINE.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.



CHASSIS BOTTOM VIEW

OF
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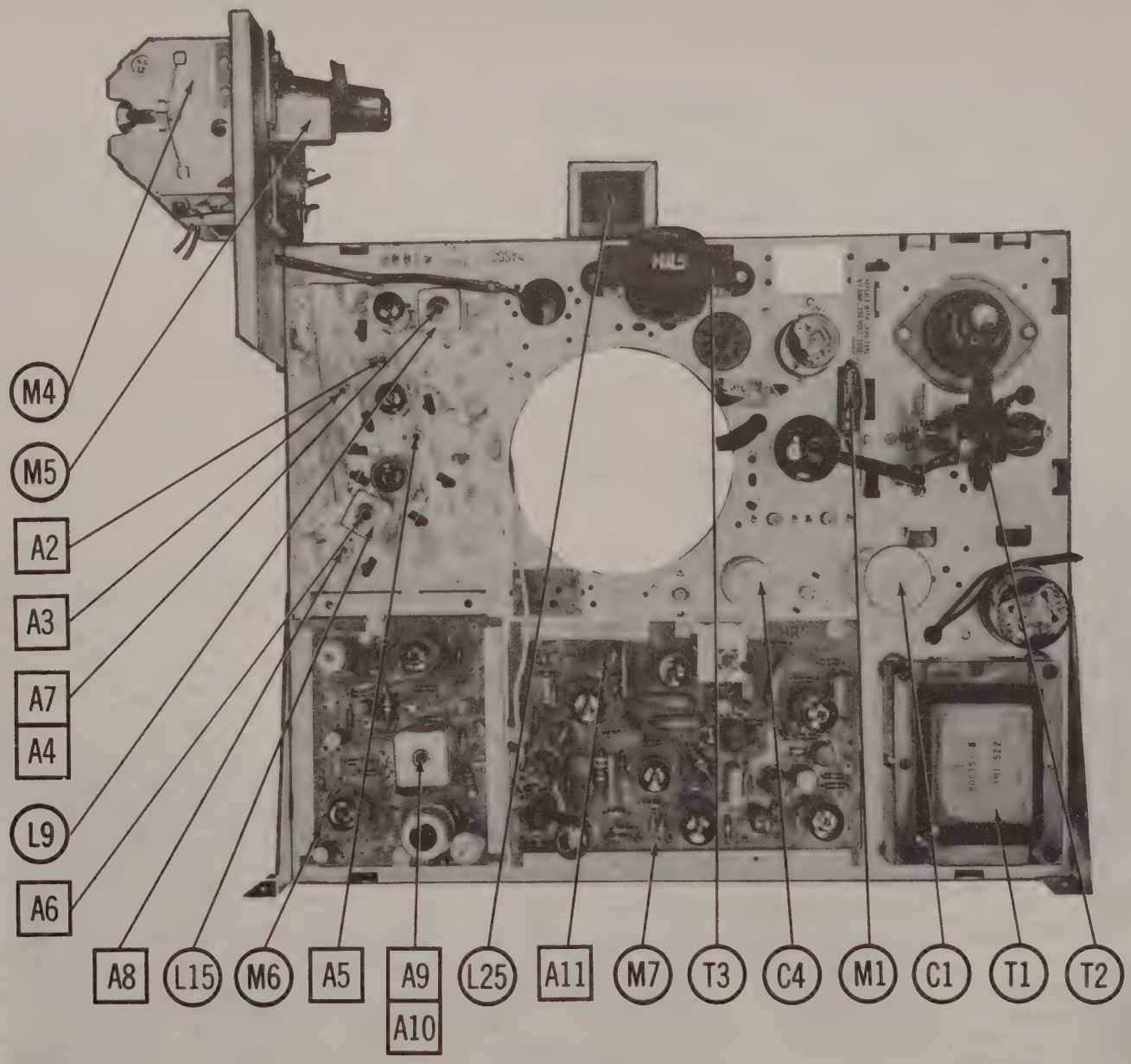

CHASSIS TOP VIEW

TUBE PLACEMENT CHART

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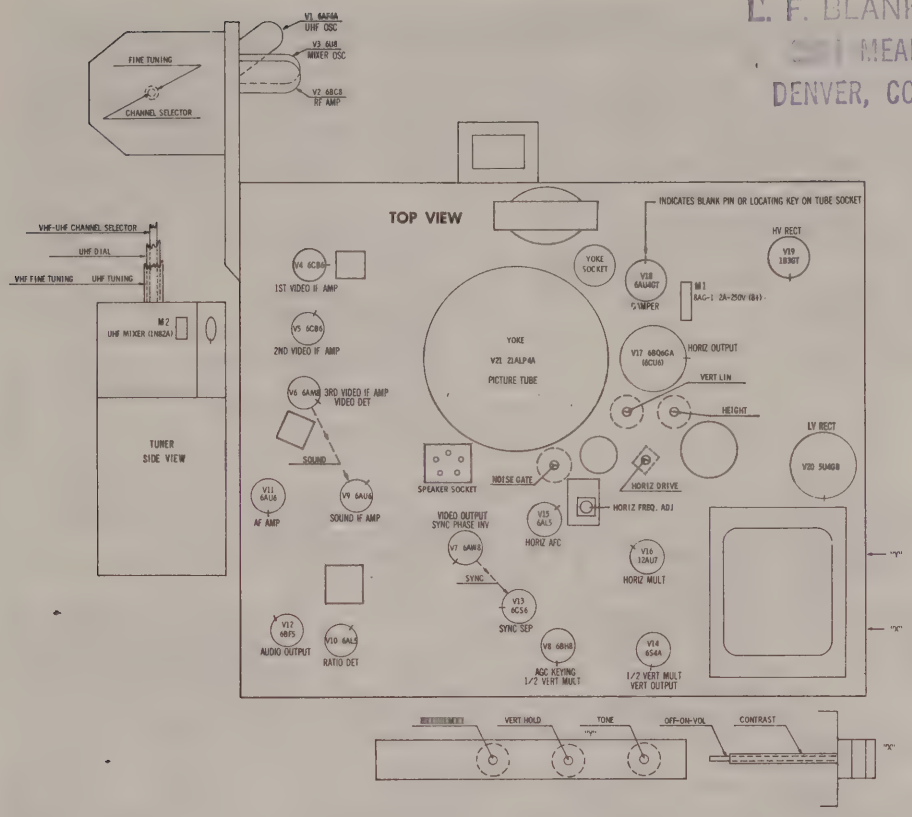

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V20, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V12 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V7, V8, V21
Has pic, no sound - V9, V10, V11, V12
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V7, V8, V14
No horiz. sync - V7, V15, V16
No vert. or horiz. sync - V7, V13

SWEEP FAILURE
No raster, has sound - V16, V17, V18, V19, V21
No vertical deflection - V8, V14
Poor vert. linearity or foldover - V8, V14
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V19, V20
Vert. off freq. - V7, V8, V14
Horiz. off freq. - V7, V15, V16

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal oscillator tube (V16) to disable the high voltage. Allow 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C32. Connect positive lead to chassis. Disconnect the antenna lead-in and connect a short jumper across the antenna terminals. Set noise gate fully clockwise. Set the contrast control fully counter clockwise. Use only enough generator output to produce useable indication on VTVM (Use lowest DC scale). Signal generator should be checked against a crystal calibrator or other frequency standard for absolute frequency calibration.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to chassis.	45.3MC (Unmod.)	12 or any unused high band channel.	DC probe through decoupling filter (Fig. 1) to point Ⓐ. Common to chassis.	A1, A2	Keep attenuating generator output to maintain VTVM reading below 3 volts. Adjust A1 and A2 for maximum deflection.
2.	"	"	41.25MC	"	"	A3	Increase generator output. Adjust A3 for MINIMUM deflection.
3.	"	"	41.5MC	"	"	A4	Adjust for maximum deflection.
4.	"	"	42.5MC	"	"	A5	Attenuate generator to keep VTVM reading below 3 volts. Adjust for maximum deflection.
5.	"	"	43.5MC	"	"	A6	"
6.	"	"	43.5MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under "Video IF Alignment". Use only enough sweep generator output to provide useable indication on the scope. If a separate marker generator is used couple it loosely to the high side of the sweep generator output lead on tube shield. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to chassis.	44.0MC (10MC Swp.)	41.25MC 42.25MC 43.0MC 45.0MC 45.75MC	12 or any unused high band channel	Vert. amp. thru decoupling filter (Fig. 1). Low side to chassis.		Check for response similar to Fig. 2. If unequal peaks occur, SLIGHTLY retouch A6. If valley between peaks exceed 20%, adjust A7. If response still is not similar to Fig. 2, repeat entire IF alignment.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

If a signal generator capable of producing a 4.5MC signal with an accuracy of ±1KC is not available, follow the procedure outlined under "Sound IF Alignment Using a TV Signal and VTVM".

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to pin 8 (plate) of 6AM8 (V6). Low side to chassis.	4.5MC (Unmod.)	Any unused channel	DC probe to point Ⓑ. Common to chassis.	A8, A9	Attenuate generator output to maintain not more than -1 volt at VTVM. Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Final adjustment of A10 is best made with a TV station tuned in. Adjust A10 for clearest sound and MINIMUM buzz. Point of MINIMUM buzz should occur between two buzz peaks which should occur when A10 is turned SLIGHTLY in one direction and then the other.

SOUND IF ALIGNMENT USING TV SIGNAL AND VTVM

Tune in a local TV station and adjust the signal input into the receiver for approximately -5 volts on the VTVM. If the signal input is too strong, the signal may be reduced by inserting an attenuator in series with the antenna and antenna terminals. If a suitable attenuator is not available, loosely couple the signal into the receiver by disconnecting the antenna lead-in and placing it near the receivers antenna terminals. The receiver should be restored to normal operating condition before attempting to tune in a local TV station.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	Not used	Not used	Not used	Any local station	DC probe to point Ⓑ. Common to chassis.	A8, A9	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to pin 8 (plate) of 6AM8 (V6). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any unused channel	Vert. amp. to point Ⓑ. Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry to Fig. 3.
9.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A10	Reconnect C2. Adjust so that 4.5MC marker occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Connect a jumper across L17. Use lowest DC scale on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 8 (plate) of 6AM8 (V6). Low side to chassis.	4.5MC (Unmod.)	Any unused channel	DC probe to point Ⓑ. Common to chassis.	A11	Adjust for MINIMUM deflection on lowest DC scale of VTVM. Remove jumper from L17.

ALTERNATE 4.5MC TRAP ALIGNMENT

Tune in a local TV station and adjust A11 for MINIMUM 4.5MC beat in the picture. An indication of 4.5MC beat interference in the picture is in the form of a gauze-like pattern of very fine vertical or diagonal lines. The pattern will vary as the sound varies forming a very fine herringbone pattern.

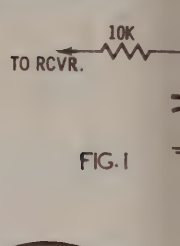

FIG. 1

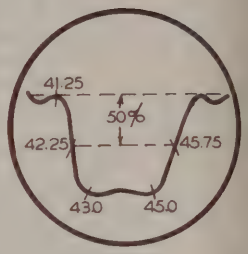

FIG. 2

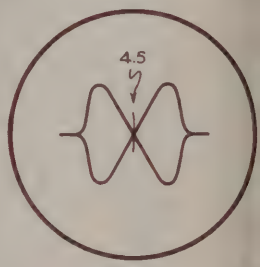

FIG. 4

FIG. 6

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal oscillator tube (V16) to disable the high voltage. Allow 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C32. Connect positive lead to chassis. Disconnect the antenna lead-in and connect a short jumper across the antenna terminals. Set noise gate fully clockwise. Set the contrast control fully counter clockwise. Use only enough generator output to produce useable indication on VTVM (Use lowest DC scale). Signal generator should be checked against a crystal calibrator or other frequency standard for absolute frequency calibration.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to chassis.	43.5MC (Unmod.)	13 or any unused high band channel.	DC probe through decoupling filter (Fig. 1) to point Ⓐ. Common to chassis.	A1, A2	Keep attenuating generator output to maintain VTVM reading below 3 volts. Adjust A1 and A2 for maximum deflection.
2.	"	"	41.25MC	"	"	A3	Increase generator output. Adjust A3 for MINIMUM deflection.
3.	"	"	41.5MC	"	"	A4	Adjust for maximum deflection.
4.	"	"	42.5MC	"	"	A5	Attenuate generator to keep VTVM reading below 3 volts. Adjust for maximum deflection.
5.	"	"	43.5MC	"	"	A6	"
6.	"	"	43.5MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under "Video IF Alignment". Use only enough sweep generator output to provide useable indication on the scope. If a separate marker generator is used couple it loosely to the high side of the sweep generator output lead on tube shield.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to chassis.	44.0MC (10MC Swp.)	41.25MC 42.25MC 43.0MC 45.0MC 45.75MC	13 or any unused high band channel	Vert. amp. thru decoupling filter (Fig. 1). Low side to chassis.		Check for response similar to Fig. 2. If unequal peaks occur, SLIGHTLY retouch A5. If valley between peaks exceed 30%, adjust A7. If response still is not similar to Fig. 2, repeat entire IF alignment.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

If a signal generator capable of producing a 4.5MC signal with an accuracy of ±1KC is not available, follow the procedure outlined under "Sound IF Alignment Using a TV Signal and VTVM".

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to pin 8 (plate) of 6AM6 (V8). Low side to chassis.	4.5MC (Unmod.)	Any unused channel	DC probe to point Ⓑ. Common to chassis.	A8, B3	Attenuate generator output to maintain not more than -1 volt at VTVM. Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Final adjustment of A10 is best made with a TV station tuned in. Adjust A10 for clearest sound and MINIMUM buzz. Point of MINIMUM buzz should occur between two buzz peaks which should occur when A10 is turned SLIGHTLY in one direction and then the other.

SOUND IF ALIGNMENT USING TV SIGNAL AND VTVM

Tune in a local TV station and adjust the signal input into the receiver for approximately -5 volts on the VTVM. If the signal input is too strong, the signal may be reduced by inserting an attenuator in series with the antenna and antenna terminals. If a suitable attenuator is not available, loosely couple the signal into the receiver by disconnecting the antenna lead-in and placing it near the receivers antenna terminals.
The receiver should be restored to normal operating condition before attempting to tune in a local TV station.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	Not used	Not used	Not used	Any local station	DC probe to point Ⓑ. Common to chassis.	A8, A9	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to pin 8 (plate) of 6AM6 (V8). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any unused channel	Vert. amp. to point Ⓑ. Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symmetry to Fig. 3.
9.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A10	Reconnect C3. Adjust so that 4.5MC marker occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines

4.5MC TRAP ALIGNMENT

Connect a jumper across L17. Use lowest DC scale on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 8 (plate) of 6AM6 (V8). Low side to chassis.	4.5MC (Unmod.)	Any unused channel	DC probe to point Ⓑ. Common to chassis.	A11	Adjust for MINIMUM deflection on lowest DC scale of VTVM. Remove jumper from L17.

ALTERNATE 4.5MC TRAP ALIGNMENT

Tune in a local TV station and adjust A11 for MINIMUM 4.5MC beat in the picture. An indication of 4.5MC beat interference in the picture is in the form of a gauze-like pattern of very fine vertical or diagonal lines. The pattern will vary as the sound varies forming a very fine herringbone pattern.

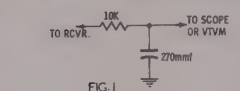

FIG. 1

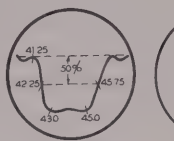

FIG. 2

FIG. 3

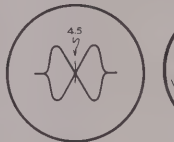

FIG. 4

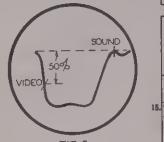

FIG. 5

FIG. 6

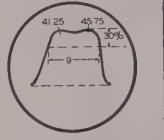

FIG. 7

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DENVER, COLORADO

VHF RF AND MIXER ALIGNMENT

Connect negative lead of a 3 volt bias supply to the tuner AGC. (Terminal D) Positive lead to chassis. Sweep and marker generator outputs should be attenuated for MINIMUM outputs that will give useable indications on scope. The marker pips should be just barely visable on response curve. If a separate marker generator is used, couple it loosely to antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The signal generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	199MC (10MC Swp.)	193.25MC 197.75MC	10	Vert. amp. thru 10kΩ to point Ⓓ. Low side to chassis.	A12, A13	Adjust for response similar to Fig. 5.
12.	"	"	65MC (10MC Swp.)	63.25MC 67.75MC	6	"	A14	"
15.	"	"	213MC (10MC Swp.)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any high band channel, make compromise adjustments of A12 and A13 with channel switch set to that channel. Check all other high band channels to see that they have not been seriously affected.
			207MC (10MC Swp.)	205.25MC 209.75MC	12			
			201MC (10MC Swp.)	199.25MC 203.75MC	11			
			195MC (10MC Swp.)	193.25MC 197.75MC	9			
			189MC (10MC Swp.)	187.25MC 191.75MC	8			
			183MC (10MC Swp.)	181.25MC 185.75MC	7			
			177MC (10MC Swp.)	175.25MC 179.75MC	6			
14.	"	"	79MC (10MC Swp.)	77.25MC 81.75MC	5	"		Check for response similar to Fig. 5. If marker falls below 70% on any low band channel, make compromise adjustment of A14 with channel switch set to that channel. Check all other low band channels to see if they have been seriously affected.
			83MC (10MC Swp.)	87.25MC 91.75MC	4			
			67MC (10MC Swp.)	65.25MC 69.75MC	3			
			57MC (10MC Swp.)	55.25MC 59.75MC	2			

VHF OSCILLATOR ALIGNMENT

Leave the bias connected as under "Video IF Alignment".
The channel oscillator adjustment screws are reached through a hold to the left of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp.)	211.25MC 215.75MC	13	Vert. amp. thru decoupling filter (Fig. 1) to point Ⓓ.	A15	Adjust to place video marker at 50% on response curve as in Fig. 5. Sound marker should fall at less than 5% on curve. It may be necessary to temporarily increase sweep and marker generator output and scope gain to view the sound marker.
			207MC (10MC Swp.)	205.25MC 209.75MC	12		A16	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A17	
			195MC (10MC Swp.)	193.25MC 197.75MC	10		A18	
			189MC (10MC Swp.)	187.25MC 191.75MC	9		A19	
			183MC (10MC Swp.)	181.25MC 185.75MC	8		A20	
			177MC (10MC Swp.)	175.25MC 179.75MC	7		A21	
			85MC (10MC Swp.)	83.25MC 87.75MC	6		A22	
			79MC (10MC Swp.)	77.25MC 81.75MC	5		A23	
			83MC (10MC Swp.)	87.25MC 91.75MC	4		A24	
			67MC (10MC Swp.)	65.25MC 69.75MC	3		A25	
			57MC (10MC Swp.)	55.25MC 59.75MC	2		A26	

ALTERNATE VHF OSCILLATOR ALIGNMENT

Tune in any local TV station. Set the fine tuning control to its mid-range position. Adjust the oscillator channel strip adjustment for clearest picture and best sound. Repeat procedure for all stations available in the area.

UHF 44MC IF ALIGNMENT

Connect bias as under "VHF RF and Mixer Alignment".
Remove IF input cable from tuner output socket for step 18. Reinsert IF input cable for step 17. Remove mixer crystal (M3) from holder.
If separate marker generator is used, loosely couple to high side of sweep generator.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	100Ω Carbon Resistor	High side thru 100Ω resistor to negative clip of crystal holder. Low side to chassis.	43.5MC (12MC Swp.)	41.25MC 45.75MC	UHF	Vert. amp. thru 10kΩ to point Ⓓ. Low side to chassis.	A27	Adjust to obtain curve similar to Fig. 7.
17.	"	"	"	"	"	Vert. amp. thru decoupling filter (Fig. 1).		Increase bias to -6 volts. Check for response curve similar to Fig. 5. If curve does not resemble Fig. 6 within tolerances, make compromise adjustment of A27. If curve cannot be made to resemble Fig. 6, check to make sure all instructions have been followed. Check V1 and V2 and repeat alignment.

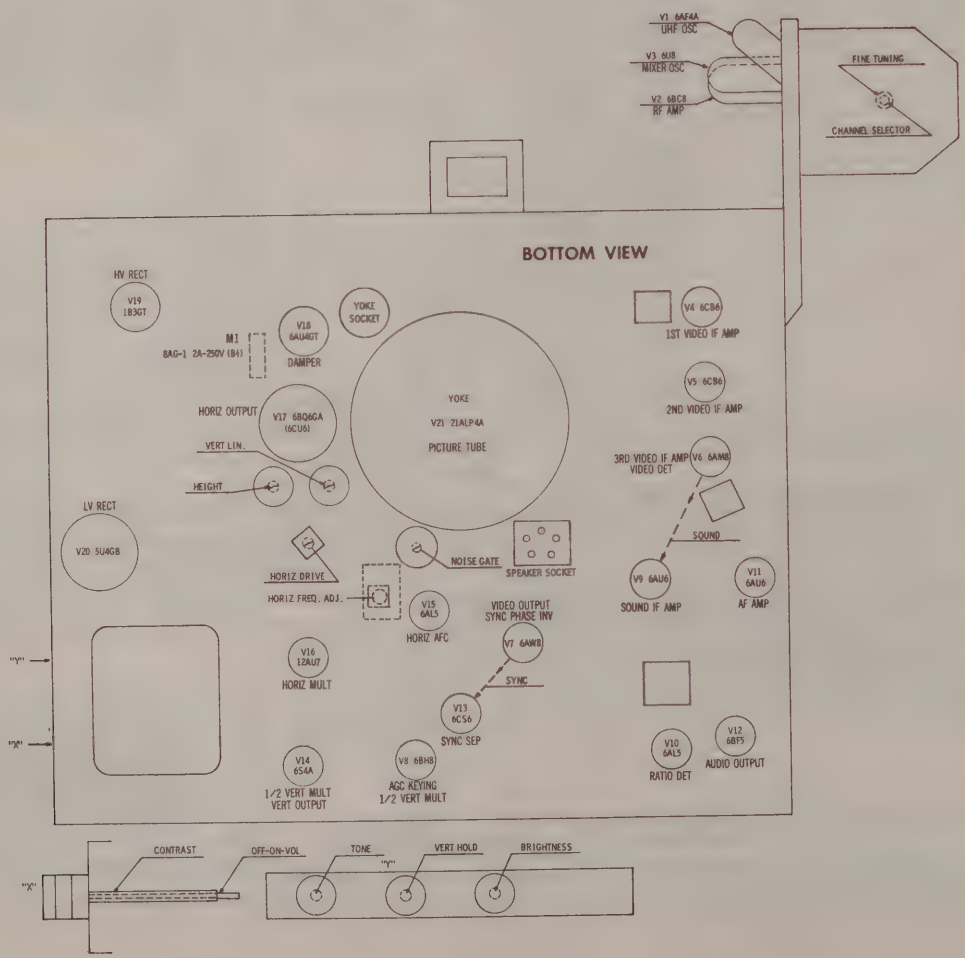
UHF TUNER ALIGNMENT

The UHF portion of this receiver has been properly aligned at the factory and is very stable. Alignment of the UHF portion of this receiver is not recommended in the field.

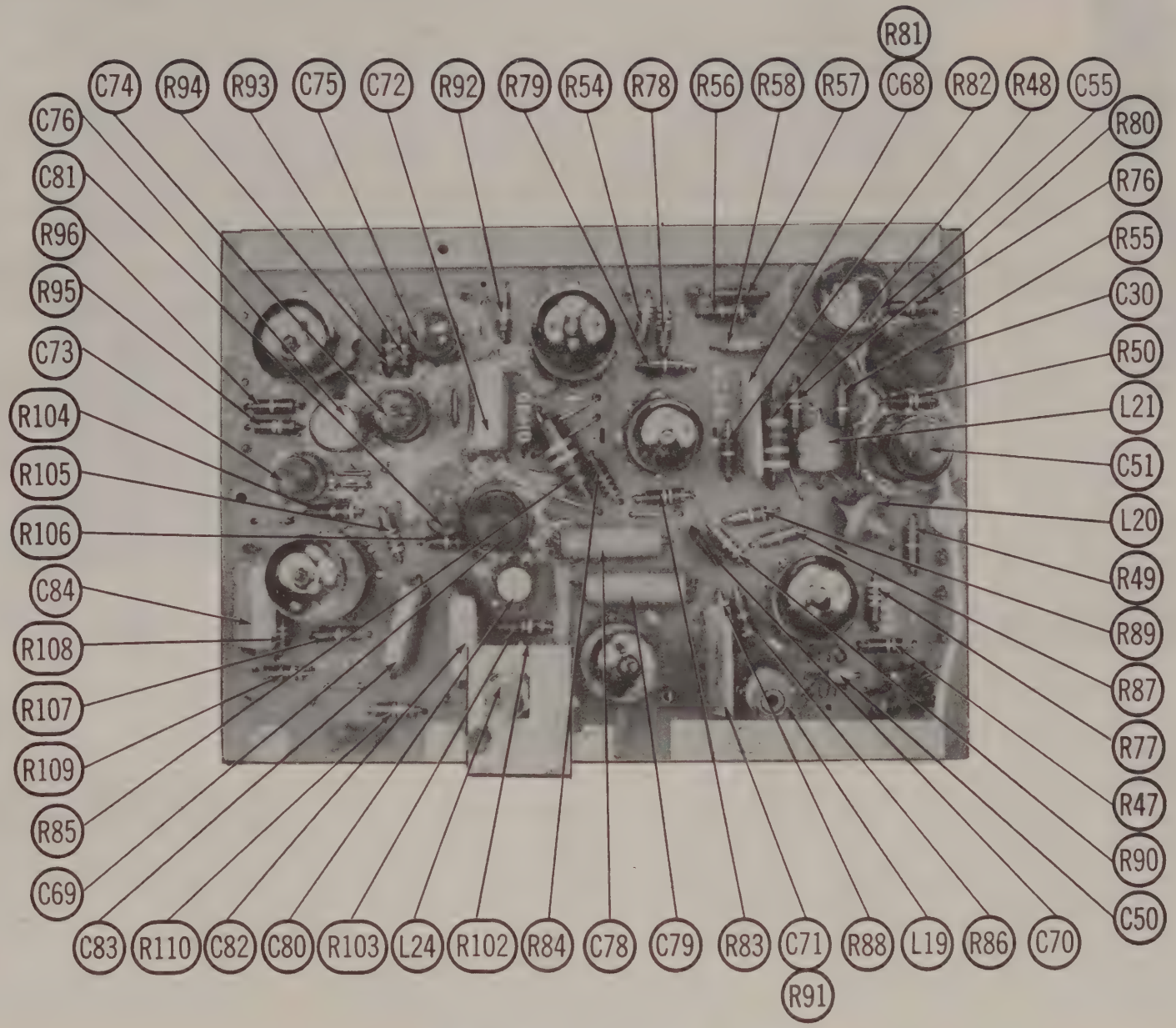
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4A	*† 20KΩ	10KΩ	. 1Ω	0Ω	0Ω	10KΩ	*† 20KΩ		
V 2	6BC8	† 3KΩ	300KΩ	INF	0Ω	. 1Ω	INF	3Meg	0Ω	† 3KΩ
V 3	6U8	† 18KΩ	5Meg	† 100KΩ	. 1Ω	0Ω	† 10KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	150KΩ	62Ω	0Ω	. 1Ω	† 5KΩ	† 5KΩ	0Ω		
V 5	6CB6	170KΩ	82Ω	. 1Ω	0Ω	† 5KΩ	† 5KΩ	0Ω		
V 6	6AM8	120Ω	0Ω	† 32KΩ	. 1Ω	0Ω	† 11KΩ	. 1Ω	4. 7KΩ	0Ω
V 7	6AW8	3. 3KΩ	1. 5Meg	† 10KΩ	. 1Ω	0Ω	.25Ω	4. 8KΩ	■ 8. 5KΩ	■ 5KΩ
V 8	6BH8	250KΩ	220KΩ	▲ 3Meg	. 1Ω	0Ω	■ 220Ω	■ 12KΩ	† 54Ω	1. 7Meg
V 9	6AU6	470KΩ	0Ω	. 1Ω	0Ω	■ 1KΩ	■ 1KΩ	120Ω		
V 10	6AL5	INF	INF	. 1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 11	6AV6	4. 7Meg	470Ω	. 1Ω	0Ω	0Ω	0Ω	† 470KΩ		
V 12	6BF5	850KΩ	20KΩ	. 1Ω	0Ω	† 525Ω	† 275Ω	850KΩ		
V 13	6CS6	50KΩ	0Ω	. 1Ω	0Ω	■ 50KΩ	■ 22KΩ	1. 8Meg		
V 14	6S4A	NC	1. 5KΩ	1. 5Meg	0Ω	. 1Ω	1. 5Meg	NC	NC	▲ 6. 5KΩ
V 15	6SL5	15Ω	15Ω	. 1Ω	0Ω	4. 8Meg	0Ω	4. 8Meg		
V 16	12AU7	† 5. 6KΩ	5Meg	1. 5KΩ	. 1Ω	. 1Ω	† 82KΩ	150KΩ	1. 5KΩ	0Ω
V 17	6HQ5GA	NC	. 1Ω	TP	† 8. 5KΩ	470KΩ	TP	0Ω	0Ω	TOP CAP ■ 15Ω
V 18	6AU4GT	TP	NC	300KΩ	NC	† 54Ω	NC	. 1Ω	0Ω	
V 19	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 485Ω
V 20	5U4GB	NC	30KΩ	NC	25Ω	NC	24Ω	NC	30KΩ	
V 21	21ALP4A	0Ω	56KΩ	PIN 6 0Ω	PIN 10 ▲ 5. 6KΩ	PIN 11 ■ 180KΩ	PIN 12 . 1Ω			

* MEASURED IN UHF POSITION.
† MEASURED FROM PIN 2 OF V20.
■ MEASURED FROM 150V LINE.
▲ MEASURED FROM PIN 3 OF V18.
TP-TIE POINT.
NC-NO CONNECTION.

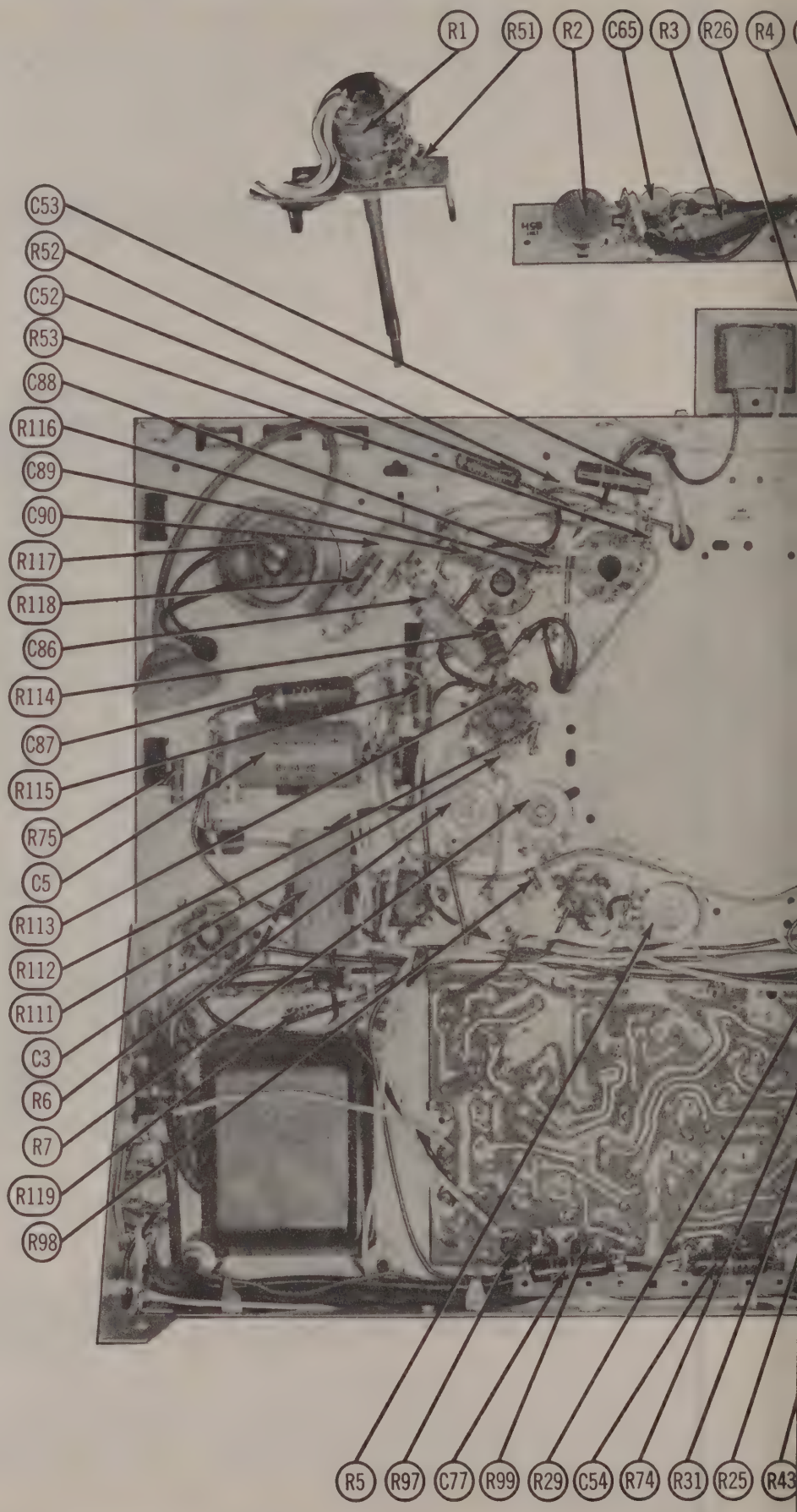


TUBE PLACEMENT CHART



SYNC CIRCUIT SUB-CHASSIS

ADMIRAL CHASSIS 20SY4BF,
E, EF, ES, F, FF, L, LF, LS


R1
R51
R2
C65
R3
R26
R4
C53
R52
C52
R53
C88
R116
C89
C90
R117
R118
C86
R114
C87
R115
R75
C5
R113
R112
R111
C3
R6
R7
R119
R98
R5
R97
C77
R99
R29
C54
R74
R31
R25
R43

CHASSIS BO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Oscillator	6AF4A	
V2	RF Amplifier	6BC8	
V3	Mixer-Oscillator	6U8	
V4	1st. Video IF Amplifier	6CB6	
V5	2nd. Video IF Amplifier	6CB6	
V6	3rd. Video IF Amplifier-Video Detector	6AM8	
V7	Video Output-Sync Phase Inverter	6AW8	
V8	AGC Keying-Vert. Mult.	6BH8	
V9	Sound IF Amplifier	6AU6	
V10	Ratio Detector	6AL5	
V11	AF Amplifier	6AV6	
V12	Audio Output	6BF5	
V13	Sync Separator	6CS6	
V14	Vert. Mult.-Vert. Output	6S4A	
V15	Horiz. AFC	6AL5	
V16	Horiz. Mult.	12AU7	
V17	Horiz. Output	6BQ6GA	Note 1
V18	Damper	6AU4GT	
V19	HV Rectifier	1B3GT	
V20	LV Rectifier	5U4GB	

Note 1. 6CU6 may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	ADMIRAL PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V21	21ALP4A ①	21ALP4A ① 21ALP4 21ALP4B ①	21ALP4A ① 21ALP4 21ALP4A/B ①	21ALP4A/B ②	① Aluminized ② Silver screen "85"
	24DP4A ①	24DP4A ①	24DP4A ①	24DP4A ② 24DP4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■60	350	67D15-105	E4C632		FP255	TM-3130	T-180	R2056 *
B	▲100	350				TC68	TD-60-350	MTD-4520	
C	▲20	200							
C2	4	50	67B27-3 (Note 1)	SRE50V5	BR550	TC30	TD-4-50	MMT-0505	TVA-1303
C3	40	200	67A4-21	PRS250V40	BR4025	TC58	TD-40-250	FM-2540	TVA-1511
C4A	■60	200	67D15-109			FP217.8	TM-3123	T-395	R1652 *
B	▲5	200				TC50X		MT-4504	
C	20	50							
C5	10	475	67A4-22	PRS500V10	BR1250	TC82	TD-10-475	MT-4710	TVA-1802

Note 1. Some versions use Mfgr's. Part #67A4-9 in this application.
* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	200		94E75-120							
C7	1000		94D84-121							
C8	1000		94D64-121							
C9	3.6		94E84-86							
C10	30		94E75-119							
C11	1500		94E75-118	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C12	1500		94E75-118	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C13	3-12									
C14	3		94D64-86	NP0-DI3		Z007	NP0A-030	ZT-553		
C15	800		94C37-90							
C16	.5-3				829-3		3139-01-0R5	CT565A		
C17	47		94D64-88		TCL-47					
C18	800		94C37-90							
C19	47		94E75-121							
C20	.5-3				829-3		3139-01-0R5	CT565A		
C21	10000		65D10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C22	1000		94D64-121							
C23	3		94D64-86	NP0-DI3		Z007	NP0A-030	ZT-553		
C24	10		94D64-91	N750-DI10	TCN-10	N018	N750A-100	NT-541	5TCU-Q1	
C25	1500		94E75-118	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C26	1500		94E75-118	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C27	800		94C37-90							
C28	1500		94E75-118	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C29	800		94C37-90							
C30	.22	200	64B16-51					PTS4022	2SE-P22	Note 2
C31	62		65C6-114	1469-00062	TCZ-62	22R5Q62	NP0-337-620			
C32	.47	100	64A10-5	P288N-47		CUB2P47			2TM-P47	
C33	800		65D10-29	BPD-008	DD-801	K067	831-801		5GA-T8	
C34	12		65C6-49		TCZ-12	TZ10	NP0K-120			
C35	330	500	65B21-331	1469-00033	D6-331	5R5T33	811-331		MS-333	
C36	800		65D10-29	BPD-0008	DD-801	K067	831-801		5GA-T8	
C37	800		65D10-29	BPD-0008	DD-801	K067	831-801		5GA-T8	
C38	1.8		65C6-101							
C39	18		65C6-91		TCZ-18	TZ12	NP0K-180			
C40	6.8		65C6-100	NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C41	800		65D10-29	BPD-0008	DD-801	K067	831-801		5GA-T8	
C42	800		65D10-29	BPD-0008	DD-801	K067	831-801		5GA-T8	
C43	800		65D10-29	BPD-0008	DD-801	K067	831-801		5GA-T8	
C44	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C45	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C46	5000		65C43-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C47	800		65D10-29	BPD-0008	DD-801		831-801		5GA-T8	
C48	800		65D10-29	BPD-0008	DD-801		831-801		5GA-T8	
C49	6.8		65B28-068	NP0-SI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C50	6.8		65B28-068	NP0-SI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C51	.22	400	64B16-28					PTS4022	4SE-P22	
C52	.0068	600	64B9-14	BPD-0068	D6-682	CUB6D8	GP3-333-682	PT6268	6TM-D68	
C53	.01	600	64B9-13	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C54	.001	1600	64A2-28	HVD-30-1000	DD30-102	CUB16S1	3KV-102	PT1621	16TM-D1	
C55	.47	200	64B16-49						2SE-P47	Note 5
C56	10		65C6-44	NP0-SI10	D6-100	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C57	20		65C6-51	NP0-SI20	TCZ-20	TZ13	NP0K-200	ZT-542	5TCC-Q2	
C58	5000		65D10-5	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C59	180		65D10-52							
C60	500			1464-0005	D6-501	5R5T5	811-501	MCB245	MS-35	
C61	470			1464-00047	D6-471	5R5T47	811-471		MS-347	Note 3
C62	.0047	400	64B16-38	BPD-0047	DD-472	K079	811-0047	PTS4247	4SE-D47	
C63	.0047	400	64B16-38	BPD-0047	DD-472	K079	811-0047	PTS4247	4SE-D47	
C64	50		65C6-4	NP0-S150	D6-500	22R5Q5	831-500	MCB225	MS-45	
C65	5000		65D10-5	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 3
C66	.01	400	64B16-36	BPD-01	DD-103	K082	811-01	PTS411	4SE-S10	
C67	.0047	600		BPD-0047	DD-472	K079	811-0047	DC-525	6SE-D47	Note 4
C68A	150	}	†63C9-3	†PA-459	†PC-184					
B	10000	}								
C69	.22	200	64B16-51					PTS4022	2SE-P22	
C70	5000		65C43-1	BPD-0047	DD-502	K080	811-005	DC-525	5HK-D5	
C71	1200		♦63C9-1	♦PA-502	♦PC-104				♦103C12	
C72	2200	500	65B21-222	1464-0022		1R5-D22			MS-222	
C73	.033	200	64B16-56	BPD-03					2SE-S33	
C74	.033	600	64B15-10							
C75	.047	400	64B16-32	BPD-05				PTS4147	4SE-S47	
C76	.047	600	64B16-9	BPD-05					6SE-S47	
C77	.001	1600	64A2-28							
C78	.001	400	64B21-1	BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C79	.001	400	64B21-1	BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C80	.0047	400	65B16-38	BPD-0047	DD-472	K079	811-0047	PTS4247	4SE-D47	
C81	.015	200	64B16-58	BPD-015	DD16-153		821-015		2SE-S15	
C82	3900	500	65B21-392	1464-0039		1R5D39			MS-239	
C83	390	500	65B21-391		D6-391	5R5T39	811-391		MS-339	
C84	680	500	65B21-681	1464-00068	D6-681	1R5T68	811-681		MS-368	
C85	4700			BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	Note 5
C86	.047	600	64B9-9	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C87	.1	600	64B9-7	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C88	230	3000	65D10-69							
C89	150	3000	65D10-68							
C90	.047	1000	64A2-30	P1088N-047		CUB16S5		PT1615	10TM-S47	

† Items C68A, C68B and R81 are combined in one unit.
♦ Items C71, R91A and R91B are combined in one unit.
Note 2. Some versions may use .1MFD unit (part #64B16-53) in this application.
Note 3. Some versions may use 2200MMF unit (part #65D10-89) in this application.
Note 4. Some versions may use .01MFD unit (part #65D10-3) in this application.
Note 5. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	½	75B11-28	F1-5	RTV-552	* QJ-884	UE64S	Contrast (Panel) Note 1
B	1Meg	½		R2-54				Volume (Rear)
C	Switch			KB-1				Attach to R1B.
R1A	1000Ω	½	75B11-21	F1-5	RTV-395	**QJ-397	UF13R }	Contrast (Panel)
B	1Meg	½		R2-54			UR16A }†	Volume (Rear)
C	Switch			KB-1			US-26 }	Attach to R1B.
R1A	1000Ω	½	75B11-29	F1-5			UF13R	Contrast (Panel)
B	1Meg	½		R2-61			UR16-T1253	Volume tapped at 160K (Rear)
C	Switch			KB-1			US-26	Attach to R1B.
D	Cover			KB-5				Attach to R1C.
R2A	2Meg	½	75C13-64	B-76	A47-2Meg-Z	Q13-139	U-55	Tone-Note 2
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A.
R3A	200KΩ	½	75C13-63	B-46	A47-200K-S	Q11-129	U-43	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R3A.
R4A	100KΩ	½	75C13-62	B-40	A47-100K-S	Q11-128	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R4A.
R5A	5Meg	½	75C20-28	AB-87	A47-5Meg-S	Q11-141	TA56L	Noise Gate
B	Shaft		Not Req.	AK-1	FKS-½	Not Req.	Not Req.	Attach to R5A.
R6A	2.5Meg	½	75C20-1	BX-83	A47-2.5Meg-S	Q11-239	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-½	RQ	Not Req.	Attach to R6A.
R7A	3000Ω	½	75C20-7	AB-8	A47-3000-S	Q11-112	U-8	Vert. Linearity
B	Shaft		Not Req.	AK-1	FKS-½	RQ	Not Req.	Attach to R7A.

* Concentrikit Equivalent, K-7 Kit, Base Elements and Shafts; B17-108 & P17-300 (Panel)
B13-137 & R2-318 (Rear)
76-1 (Switch)

** Concentrikit Equivalent, K-2 Kit, Base Elements and Shafts; B17-108 & P1-126 (Panel)
B13-137 & R2-212 (Rear)
76-1 (Switch)

† Universal Replacement (Mallory Exact Duplicate Part No. UE57S).
Note 1. Some versions will use an alternate control Part No. 75B11-21 or Part No. 75B11-29 in this application.
Note 2. Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R8	10KΩ				
R9	1000Ω			BTS-1000	
R10	100Ω				
R11	47KΩ			BTS-47K	
R12	22KΩ			BTS-22K	
R13	820KΩ			BTS-820K	
R14	470KΩ			BTS-470K	
R15	1500Ω	1		BTA-1500	
R16	10KΩ				
R17	27KΩ				
R18	3300Ω	1		BTA-3300	
R19	6800Ω				
R20	100KΩ			BTS-100K	
R21	100KΩ			BTS-100K	
R22	100KΩ			BTS-100K	
R23	8200Ω			BTS-8200	
R24	100KΩ			BTS-100K	
R25	1500Ω	1		BTA-1500	
R26	15KΩ	2		BTB-15K	Note 1
R27	1000Ω			BTS-1000	Note 2
R28	22Meg			BTS-22Meg	Note 2
R29	430KΩ 5%			BTS-430K 5%	Note 2
R30	560KΩ			BTS-560K	
R31	4.7Meg			BTS-4.7Meg	
R32	1000Ω			BTS-1000	
R33	24KΩ 5%				
R34	22KΩ 5%				Note 3
R35	1000Ω			BTS-1000	
R36	62Ω 5%			BTS-62 5%	
R37	22KΩ 5%			BTS-22K 5%	Note 4
R38	39KΩ 5%				
R39	1000Ω			BTS-1000	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R40	82Ω			BTS-82	
R41	4000Ω	7		PW7-4000	
R42	1000Ω			BTS-1000	
R43	10KΩ	2		BTB-10K	
R44	22KΩ			BTS-22K	
R45	120Ω			BTS-120	
R46	4700Ω			BTS-4700	
R47	100Ω			BTS-100	
R48	4700Ω	2		BTB-4700	
R49	8200Ω			BTS-8200	
R50	180KΩ			BTS-180K	
R51	470Ω			BTS-470	
R52	56KΩ			BTS-56K	
R53	2700Ω			BTS-2700	
R54	390KΩ			BTS-390K	
R55	8.2Meg			BTS-8.2Meg	Note 5
R56	4.7Meg			BTS-4.7Meg	
R57	2.2Meg			BTS-2.2Meg	
R58	680KΩ			BTS-680K	
R59	470KΩ			BTS-470K	
R60	1000Ω			BTS-1000	
R61	120Ω			BTS-120	
R62	390Ω			BTS-390	
R63	47KΩ			BTS-47K	
R64	10KΩ			BTS-10K	
R65	10KΩ			BTS-10K	
R66	4.7Meg			BTS-4.7Meg	
R67	470KΩ			BTS-470K	
R68	470Ω			BTS-470	
R69	27KΩ	1		BTA-27K	
R70	2Meg 5%			BTS-2Meg 5%	Note 6
R71	1.6Meg 5%			BTS-1.6Meg 5%	Note 7

RESISTOR

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R72	100Ω			BTS-100	
R73	3.3Meg			BTS-3.3Meg	Note 2
R74	220Ω			BTS-220	
R75	220Ω	1		BTA-220	
R76	150KΩ			BTS-150	
R77	47KΩ			BTS-47K	
R78	470KΩ			BTS-470K	
R79	6800Ω			BTS-6800	
R80	15KΩ			BTS-15K	
R81	270KΩ		† 63C9-3	BTS-270K	
R82	1.8Meg			BTS-1.8Meg	
R83	120KΩ			BTS-120K	
R84	68KΩ			BTS-68K	
R85	22KΩ	2		BTB-22K	
R86	4.7Meg			BTS-4.7Meg	
R87	2.2Meg			BTS-2.2Meg	
R88	3300Ω			BTS-3300	
R89	3300Ω			BTS-3300	
R90	6800Ω			BTS-6800	
R91A	38.4KΩ		♦ 63C9-1		
B					
R92	220KΩ			BTS-220K	
R93	2.7Meg			BTS-2.7Meg	Note 8
R94	15KΩ			BTS-15K	
R95	150KΩ			BTS-150K	Note 9
R96	1.5Meg			BTS-1.5Meg	Note 8

Note 1. Some versions use a 470Ω ½W
Note 2. Not used in some versions.
Note 3. A 6800Ω ½W 5% resistor is u
Note 4. Some versions use a 1000Ω ½
Note 5. A 15Meg ½W resistor is used
Note 6. Some versions use a 1Meg ½
Note 7. Some versions use a 820KΩ
Note 8. Some versions use a 2.2Meg
Note 9. A 120KΩ ½W resistor is used
Note 10. A 15KΩ 2W resistor is used
Note 11 In chassis stamped run 20 an
2W resistors wired in paralle
Note 12. Used in early versions only.
Note 13. Used only when HV transfor

TRANSFORMER

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	ADMIRAL PART No.
T1	117VAC	575VCT	5V	6.3V	80C35-8
	③ L 6A	③ .220A	③ 3A	③ 12A	

① Tape 840VCT ③ 730VCT and 370VCT windings. Tape 5V③ 6
② Parallel and phase 6.3V windings.
③ Parallel and phase 6.3V ③ 6A windings. Tape 6.3V ③ 1.2A

TRANSFORMERS (SV

ITEM No.	USE	ADMIRAL PART No.	Halldorson PART No.	Merit PART No
T2	Horiz. Output Trans.	79D65-2	FB420 *	HVO-54 *
		79D65-4 ①		
T3	Vert. Output Trans.	79B43-4	Z1900 ②	A-2824 ④
			③	⑤
T4A	Yoke(90°) Horiz. (18.5MH)	94D87-10 ⑥	DF607 ⑧	MDF-92 ⑧
			⑨	⑨
B	Vert. (37MH)	94D87-8 ⑤⑦		

① Alternate horizontal output transformer used in chassis 20SY
② Use 15 to 1 turns ratio.
③ Connect as auto transformer.
④ Drill new mounting hole(s).
⑤ Cut and tape yellow lead.
⑥ Includes plug, Admiral part #88A18-3 and resistors R100, R
⑦ Alternate yoke used in chassis 20SY4BF, 20SY4E, 20SY4F a
Runs 18 and 23.
⑧ Use original horizontal yoke damping network.
⑨ Loosen and rotate core clamp 180°, then connect same as o

*HORIZONTAL OUTPUT TRAN

Use Original Width Coil Unle

	ADMIRAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacem Connecti
	5	5	5	
	6	3	4	
	7	See Note ⑩ 3	2	
	8	1	1	
Special Notes →		10 ⑪	⑪	

⑩ Replace capacitor C54 with approximately 25 to 50MMF
⑪ Requires 2 turns for filament winding.

TRANSFORMER (A

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Sta PAR
T5	2.7KΩ	3-4Ω	Part of Speaker 78B105-1	Z1001	A2928	A3

SPEAK

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT D ADMIRAL PART No.	QUAM PART No.
SP1	4"	PM	3-4Ω	78B105-1	4A07

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C59	180		85D10-52							
C60	500			1464-0005	DC-501	5S5T5	81L-501	MC3545	MS-35	
C61	470			1464-00047	DC-471	5S5T47	81L-471		MS-347	Note 3
C62	.0047	400	84B16-38	BPD-0047	DD-472	K079	81L-0047	PT84347	4SK-D47	
C63	.0047	400	84B16-38	BPD-0047	DD-472	K079	81L-0047	PT84347	4SK-D47	
C64	50		85C8-4	NPO-8150	DC-500	33X5Q6	831-500	MC3325	MS-45	
C65	5000		85D10-5	85D10-5	DD-502	K080	81L-005	DC-525	5SK-D5	Note 3
C66	.01	400	84B16-36	BPD-01	DD-103	K083	81L-01	PT8411	4SK-E10	
C67	.0047	600		BPD-0047	DD-472	K079	81L-0047	DC-525	6SK-D47	Note 4
C68A	150		↑ 103C9-3	TPA-459	TPC-184					
B	10000									
C69	.33	200	84B16-51					PT84033	2SK-P33	
C70	5000		85C43-1	BPD-0047	DD-502	K080	81L-005	DC-525	5SK-D5	
C71	1200		≠63C9-1	≠PA-502	≠PC-104				≠103C12	
C72	2200	500	83B1-332	1464-0022		IR8-D22			MS-322	
C73	.033	200	84B16-56	BPD-03					2SE-S33	
C74	.033	600	84B16-48							
C75	.047	400	84B16-33	BPD-05				PT84147	4SK-S47	
C76	.047	600	84B16-9	BPD-05					6SK-S47	
C77	.001	1600	84A3-28							
C78	.001	400	84B21-1	BPD-001	DS-102	CUB6D1	GP2L-102	PT831	6TM-D1	
C79	.001	400	84B21-1	BPD-001	DS-102	CUB6D1	GP2L-102	PT831	6TM-D1	
C80	.0047	400	84B16-38	BPD-0047	DD-472	K079	81L-0047	PT84347	4SK-D47	
C81	.015	200	84B16-58	BPD-015	DD18-153		821-015		2SE-S15	
C83	3900	500	83B21-392	1464-0039		IR8D39			MS-339	
C85	390	500	83B21-391		DS-391	5S5T39	81L-391		MS-339	
C84	680	500	83B21-681	1464-00068	DS-681	IR8T68	81L-681		MS-368	
C85	4700			BPD-0047	DD-472	K079	81L-0047	DC-525	5SK-D47	Note 5
C86	.047	600	84B9-9	BPD-05		DP-503	CUB9S47	PT8147	6TM-S47	
C87	.1	600	84B9-11	P6839-1		DP-104	CUB9P1	PT801	6TM-P1	
C88	230	3000	85D10-59							
C89	150	3000	85D10-58							
C90	.047	1000	84A3-38		P1088N-047		CUB6S5		PT1618	10TM-D47

† Items C68A, C68B and R81 are combined in one unit.
≠ Items C71, R80A and R81B are combined in one unit.
Note 2. Some versions may use .1MFD unit (part #84B21-53) in this application.
Note 3. Some versions may use 2200MMF unit (part #65D10-89) in this application.
Note 4. Some versions may use .01MFD unit (part #85D10-3) in this application.
Note 5. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	½	75B11-38	F1-5	RTV-533	* QJ-534	UR54	Contrast (Panel) Note 1
B	1Meg			R2-54				Volume (Rear)
C	Switch			KB-1				Attach to R1B.
R1A	1000Ω	½	75B11-21	F1-5	RTV-395	**QJ-397	UY1SR) †	Contrast (Panel)
B	1Meg	½		R2-54			UR18A)	Volume (Rear)
C	Switch			KB-1			U5-36)	Attach to R1B.
R1A	1000Ω	½	75B11-39	F1-5			UY1SR	Contrast (Panel)
B	1Meg			R2-51			UR18-T2153	Volume tapped at 160K (Rear)
C	Switch			KB-1			U5-36	Attach to R1B.
D	Cover			KB-5				Attach to R1C.
R2A	1Meg	½	75C13-64	B-76	A47-2Meg-Z	Q13-139	U-56	Tone-Note 2
B	Shaft		Not Req.	Not Req.	KB-3	Not Req.	Not Req.	Attach to R2A.
R3A	300KΩ	½	75C13-63	B-46	A47-300K-S	Q11-132	U-43	Vert. Hold
B	Shaft		Not Req.	Not Req.	KB-3	Not Req.	Not Req.	Attach to R3A.
R4A	100KΩ	½	75C13-62	B-60	A47-100K-S	Q11-131	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KB-3	Not Req.	Not Req.	Attach to R4A.
R5A	5Meg	½	75C20-26	AB-87	A47-5Meg-S	Q11-46	TA45L	Noise Gate
B	Shaft		Not Req.	AK-1	FK3-1	Not Req.	Not Req.	Attach to R5A.
R6A	2.5Meg	½	75C20-1	BX-83	A472.5Meg-S	Q11-239	SU-565	Height
B	Shaft		Not Req.	Not Req.	FK2-1	Not Req.	Not Req.	Attach to R6A.
R7A	3000Ω	½	75C20-7	AB-8	A47-3000-S	Q11-113	U-8	Vert. Linearity
B	Shaft		Not Req.	AK-1	FK3-1	SQ	Not Req.	Attach to R7A.

* Concentrikit Equivalent, K-7 Kit, Base Elements and Shafts; B17-108 & P17-320 (Panel)
B13-137 & R3-318 (Rear)
T6-1 (Switch)
**Concentrikit Equivalent, K-2 Kit, Base Elements and Shafts; B17-108 & P1-128 (Panel)
B13-137 & R3-212 (Rear)
T6-1 (Switch)
† Universal Replacement (Mallory Exact Duplicate Part No. UE57B).
Note 1. Some versions will use an alternate control Part No. 75B11-21 or Part No. 75B11-29 in this application.
Note 2. Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R8	10KΩ			BTS-1000	
R9	1000Ω				
R10	[illegible]				
R11	47KΩ			BTS-47K	
R12	22KΩ			BTS-22K	
R13	[illegible]			BTS-820K	
R14	470KΩ			BTS-470K	
R15	1500Ω	1		BTA-1500	
R16	10KΩ				
R17	27KΩ				
R18	3300Ω	1		BTA-3300	
R19	6800Ω				
R20	100KΩ			BTS-100K	
R21	100KΩ			BTS-100K	
R22	100KΩ			BTS-100K	
R23	8200Ω			BTS-8200	
R24	100KΩ			BTS-100K	
R25	1500Ω	1		BTA-1500	
R26	15KΩ	2		BTB-15K	Note 1
R27	100Ω			BTS-1000	Note 2
R28	22Meg			BTS-22Meg	Note 2
R29	430KΩ	5%		BTS-430K 5%	Note 2
R30	560KΩ			BTS-560K	
R31	4.7Meg			BTS-4.7Meg	
R32	100Ω			BTS-1000	
R33	240KΩ	5%			
R34	22KΩ	5%			Note 3
R35	100Ω			BTS-100B	
R36	62Ω	5%		BTS-62 5%	
R37	22KΩ	5%		BTS-22K 5%	Note 4
R38	50KΩ	5%			
R39	1000Ω			BTS-1000	

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R40	82Ω			BTS-82	
R41	4000Ω	7		PW7-4000	
R42	1000Ω			BTS-1000	
R43	10KΩ	2		BTB-10K	
R44	22KΩ			BTS-22K	
R45	10Ω			BTS-10	
R46	4700Ω			BTS-4700	
R47	100Ω			BTS-100	
R48	4700Ω	2		BTB-4700	
R49	8200Ω			BTS-8200	
R50	180KΩ			BTS-180K	
R51	470Ω			BTS-470	
R52	56KΩ			BTS-56K	
R53	2700Ω			BTS-2700	
R54	390KΩ			BTS-390K	
R55	8.2Meg			BTS-8.2Meg	Note 5
R56	4.7Meg			BTS-4.7Meg	
R57	2.2Meg			BTS-2.2Meg	
R58	680KΩ			BTS-680K	
R59	470KΩ			BTS-470K	
R60	100Ω			BTS-100	
R81	120Ω			BTS-120	
R82	390Ω			BTS-390	
R83	47KΩ			BTS-47K	
R84	10KΩ			BTS-10K	
R85	10KΩ			BTS-10K	
R86	4.7Meg			BTS-4.7Meg	
R87	470KΩ			BTS-470K	
R88	47Ω			BTS-470	
R89	27KΩ	1		BTA-27K	
R70	2Meg 5%			BTS2Meg 5%	Note 8
R71	1.6Meg 5%			BTS1.6Meg 5%	Note 7

RESISTORS (cont)

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R72	3.3Meg			BTS-3.3Meg	Note 2
R74	2300Ω			BTS-230	
R75	220Ω	1		BTA-220	
R76	150KΩ			BTS-150	
R77	47KΩ			BTS-47K	
R78	470KΩ		↑ 63C9-3	BTS-470K	
R79	6800Ω			BTS-6800	
R80	15KΩ			BTS-15K	
R81	270KΩ			BTS-270K	
R82	1.5Meg			BTS-1.5Meg	
R83	150KΩ			BTS-150K	
R84	68KΩ			BTS-68K	
R85	22KΩ	2		BTB-22K	
R86	4.7Meg			BTS-4.7Meg	
R87	2.2Meg			BTS-2.2Meg	
R88	330KΩ			BTS-330K	
R89	3300Ω			BTS-3300	
R90	6800Ω		≠ 63C9-1	BTS-6800	
R91A	35K 43KΩ				
B					
R92	230KΩ			BTS-230K	
R93	2.7Meg			BTS-2.7Meg	Note 9
R94	15KΩ			BTS-15K	
R95	150KΩ			BTS-150K	Note 9
R96	1.5Meg			BTS-1.5Meg	Note 8

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R97	220KΩ			BTS-220K	
R98	8200Ω			BTS-820	
R99	100KΩ			BTS- 100K	
R100	560Ω				
R101	560Ω				
R102	100KΩ 5%				
R103	100KΩ 5%				
R104	4.7Meg				
R105	470KΩ				
R106	[illegible]				
R107	1500Ω				
R108	180KΩ				
R109	[illegible]				
R110	82KΩ				
R111	470KΩ				
R112	100Ω				
R113	100Ω				
R114	8200Ω	2			Note 10
R115	5600Ω	2		BTB-5600	Note 11
R116	270Ω				
R117	4.7Ω			BW½-4.7	
R118	15Ω	1		BTA-15	
R119	470KΩ			BTS-470K	Note 13
R120	10Ω			BTS-10	Note 13
R121	620KΩ 5%			BTS-620K 5%	Note 2
R123	330KΩ			BTS-330K	Note 2

Note 1. Some versions use a 470Ω ½W resistor in this application.
Note 2. Not used in some versions.
Note 3. A 8800Ω ½W 5% resistor is used in chassis stamped run 23 or higher.
Note 4. Some versions use a 10000Ω ½W resistor in this application.
Note 5. A 15Meg ½W resistor is used in chassis stamped below run 15.
Note 6. Some versions use a 1Meg ½W 5% resistor in this application.
Note 7. Some versions use a 820KΩ ½W 5% resistor in this application.
Note 8. Some versions use a 2.2Meg ½W resistor in this application.
Note 9. A 120KΩ ½W resistor is used in chassis stamped below run 2.
Note 10. A 15KΩ 2W resistor is used in chassis stamped run 22 and above.
Note 11 In chassis stamped run 20 and above, R115 is replaced with two 18KΩ 2W resistors wired in parallel.
Note 12. Used in early vertical only.
Note 13. Used only when HV transformer is Part No. 79D65-4.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	575VCT	5V	6.3V	80C35-8	P9999 ①	P2838 ③			R-61BC ③
	② 1.6A	② .220A	② 3A	② 12A						

① Tape 840VCT ② 780VCT and 370VCT windings. Tape 5V ② 6A winding. Parallel and phase 6.3V windings.
② Parallel and phase 6.3V windings.
③ Parallel and phase 6.3V ② 6A windings. Tape 6.3V ② 1.2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Horiz. Output Trans.	79D65-2	FB420 *	HVO-54 *		X129 *	A-8255 *	FLY-76 *	D-49 *
		79D65-4 ⑤							
T3	Vert. Output Trans.	79B43-4	Z1800 ②	A-3834 ②		V312	A-8141	28854	A-39X ③
T4A	Yoke(80°)Horiz.	94D87-10 ⑧	DF807 ⑧	MDF-92 ⑧	235D1 ⑧	Y90F19/42 ⑧	DY-16A ⑧	Y-16 ⑧	Y-61-I ⑧
	(18.5MH)								
B	Vert. (37MH)	94D87-9 ③⑦							

① Alternate horizontal output transformer used in chassis 20SY4E, 20SY4EF, 20SY4F, 20SY4FF, 20SY4L, 20SY4LS, Runs 22 and 23.
② Use 15 to 1 turns ratio.
③ Connect as auto transformer.
④ Drill new mounting hole(s).
⑤ Cut and tape yellow lead.
⑥ Includes plug, Admiral part #88A18-3 and resistors R100, R101.
⑦ Alternate yoke used in chassis 20SY4BP, 20SY4E, 20SY4F and 20SY4L, 20SY4EF, 20SY4FF and 20SY4LS, Runs 18 and 23.
⑧ Use original horizontal yoke damping network.
⑨ Loosen and rotate core clamp 180° , then connect same as original.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5	5	5	5	5	5
8	3	4	4	4	4	4	7
7	See Note ⑩ 3	2	2	2	2	1	
8	1	1	1	1	1	2	
Special Note:	10 ⑪	⑪	⑪	⑪	⑪	⑪	⑪

⑩ Replace capacitor C54 with approximately 25 to 50MMF ② 4KV (Min.).
⑪ Requires 2 turns for Filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	2.7kΩ	3-4Ω	Part of Speaker 78B105-1	Z1001	A3938	A3878	22846	S-1X	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3-4Ω	78B105-1	4A07	223S	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	FIL Choke	0Ω		94R75-116				
B	FIL Choke	0Ω		94R75-117				
L2	Cathode Choke	0Ω		94R75-117				
L3	UHF IF Coil	0Ω		94R75-114				
L4	UHF IF Coil	0Ω		94R75-115				
L5A	VHF Ant. Coil	0Ω	0Ω	94R75-53				Channel 2
B	VHF Ant. Coil	0Ω	0Ω	94R75-53				Channel 3
C	VHF Ant. Coil	0Ω	0Ω	94R75-54				Channel 4
D	VHF Ant. Coil	0Ω	0Ω	94R75-55				Channel 5
E	VHF Ant. Coil	0Ω	0Ω	94R75-56				Channel 6
F	VHF Ant. Coil	0Ω	0Ω	94R75-57				Channel 7
G	VHF Ant. Coil	0Ω	0Ω	94R75-58				Channel 8
H	VHF Ant. Coil	0Ω	0Ω	94R75-59				Channel 9
I	VHF Ant. Coil	0Ω	0Ω	94R75-60				Channel 10
J	VHF Ant. Coil	0Ω	0Ω	94R75-61				Channel 11
K	VHF Ant. Coil	0Ω	0Ω	94R75-62				Channel 12
L	VHF Ant. Coil	0Ω	0Ω	94R75-63				Channel 13
L5B	VHF RF, Mixer Grid, Osc. Coils	0Ω		94R75-72				Channel 2
B	VHF RF, Mixer Grid, Osc. Coils	0Ω		94R75-73				Channel 3
C	VHF, RF, Mixer Grid, Osc. Coils	0Ω		94R75-74				Channel 4
D	VHF, RF, Mixer Grid, Osc. Coils	0Ω		94R75-75				Channel 5
E	VHF, RF, Mixer Grid, Osc. Coils	0Ω		94R75-76				Channel 6
F	VHF RF, Mixer Grid, Osc. Coils	0Ω		94R75-77				Channel 7
G	VHF RF, Mixer Grid, Osc. Coils	0Ω		94R75-78				Channel 8
H	VHF RF, Mixer Grid, Osc. Coils	0Ω		94R75-79				Channel 9
I	VHF RF, Mixer Grid, Osc. Coils	0Ω		94R75-80				Channel 10
J	VHF RF, Mixer Grid, Osc. Coils	0Ω		94R75-81				Channel 11
K	VHF RF, Mixer Grid, Osc. Coils	0Ω		94R75-82				Channel 12
L	VHF RF, Mixer Grid, Osc. Coils	0Ω		94R75-83				Channel 13
M	UHF IF Coil	.3Ω		94R75-64				Includes 5.6KΩ resistor-Resistance of coil with resistor: 3Ω

ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L8	Conv. Plate	.1Ω	72BD153-1						
L9	1st Video IF			19-1001		4804			L. S Microhenries
L10	FIL Choke	0Ω		17-4523		6219			
L11	2nd Video IF	0Ω	72DD11-36	17-4523	TV-130	6219			
L12	4L.25MC Trap	.1Ω	72DD11-37	20-1045		6235			
L13	FIL Choke	0Ω		19-1001		4804			L. S Microhenries
L14	3rd Video IF	0Ω	72DD11-38	17-4523	TV-130	6219			
L15	4th Video IF	.1Ω	72B143-2	17-5004 *	TV-125 *	6234 *			
L16	Series Peaking Coil	L.6Ω	72A34-1	19-1004		4680			6.4 Microhenries
L17	Series Peaking Coil	5.5Ω	72B5-15	19-3180 ▲	TV-184 ▲	6180 ▲			184 Microhenries, Wound on 4. 7KΩ resistor
L18	Shunt Peaking Coil	17Ω	72B5-7	19-3500		6174			500 Microhenries
L19	4. 5MC Trap	4. 8Ω	72C152-1						
L20	Series Peaking Coil	5.6Ω	72B6-14	19-3360 ■	TV-185 ■	6181 ■			336 Microhenries; Wound on 18KΩ resistor
L21	Shunt Peaking Coil	24Ω	72AJ1-4			6186 †			790 Microhenries
L22	Sound IF	4.8Ω	72C152-1						
L23	Ratio Det.	3.8Ω	.3GCT	72C68-4					Tertiary Windings, TB

* Use adaptor plate.
■ Parallel with 18KΩ resistor.
▲ Parallel with 4. 7KΩ resistor.
† Parallel with 10KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES PRI.	SEC.	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L24	53Ω		94C17-4							

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 Cy.	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L25	.220A	54Ω	1.5HY	74B18-13	C5040 ①		C2327 ①	26C41 ①	C-31X ①

① Drill new mounting holes.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ADMIRAL PART No. FUSE	ADMIRAL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	8AG	1A 8/B	84A1-33	84A5-4	342, 500 (8AG 1A)	387002	AGK1	4520

Note: Used in late production only.

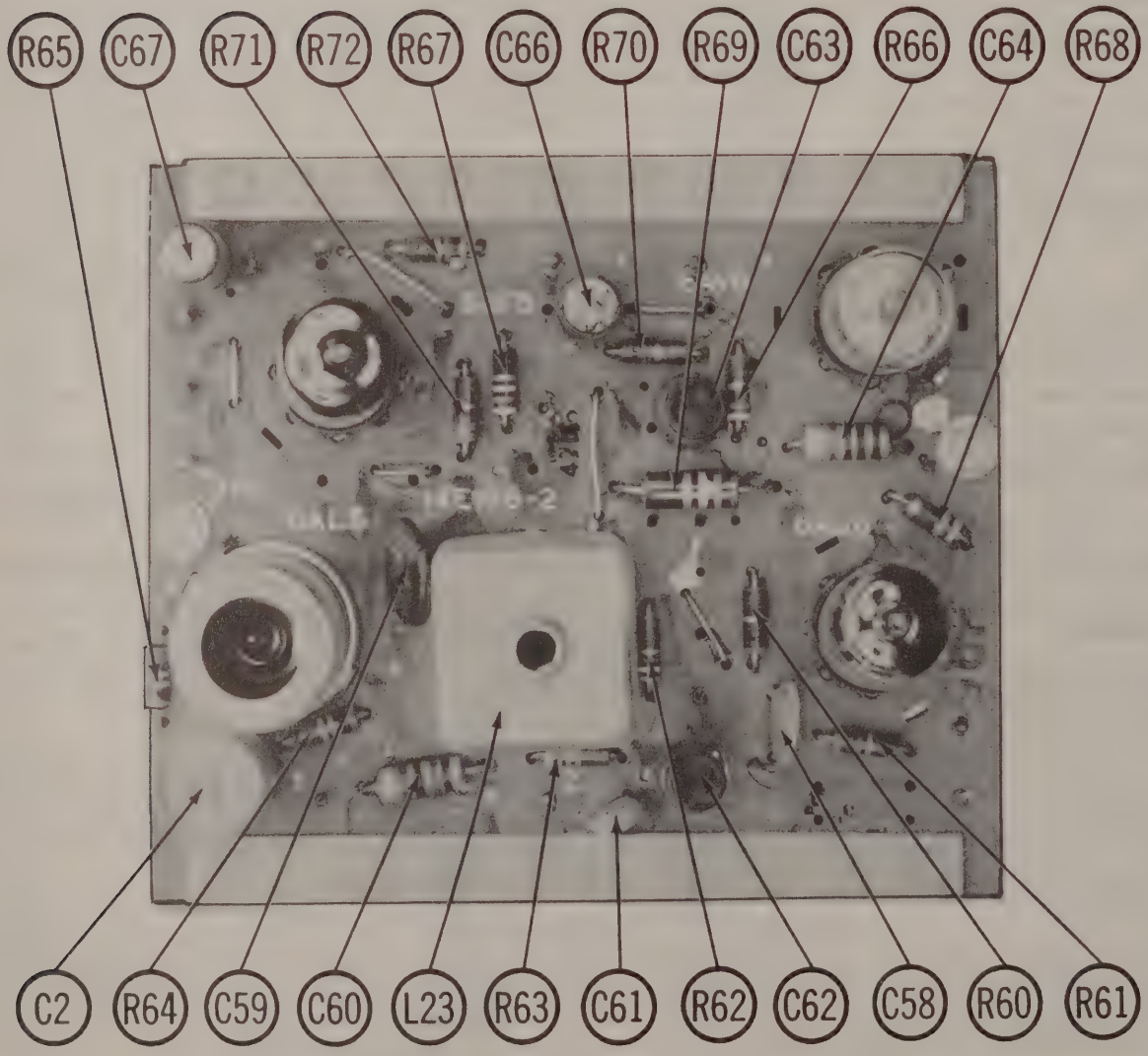
PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		ADMIRAL PART No.	SYLVANIA PART No.	
M2	1N82A		1N82 or 1N82A	UHF Mixer (Clip in)

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Dial Light	81A1-12	#51; Not used in some versions.
M4	Tuner	94E75-19	VHF-UHF Combination
M5	Trap	94D64-84	VHF Ant. Input Filter
M6	Printed Circuit Board	A4863	Sound
M7	Printed Circuit Board	A4868-1	Sync-Used in some versions
	Printed Circuit Board	A4868-2	Sync-Used in some versions
M8	Centering Device	94A71-1	
M9	Ion Trap	94A15-4	
B2	Trimmer Cap.	66A30-3	Horiz. Drive (170-780MMF)



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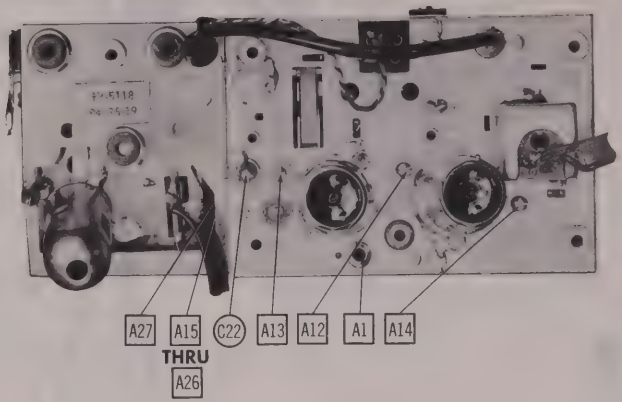
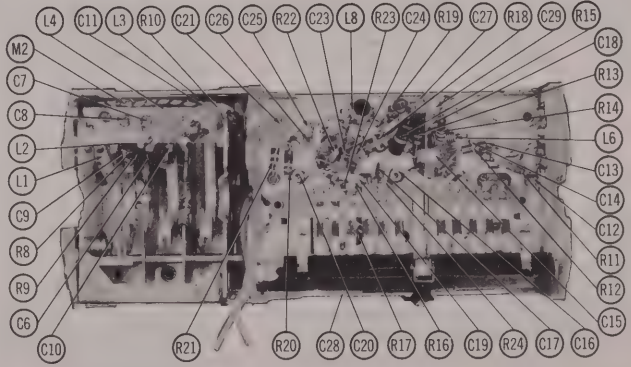
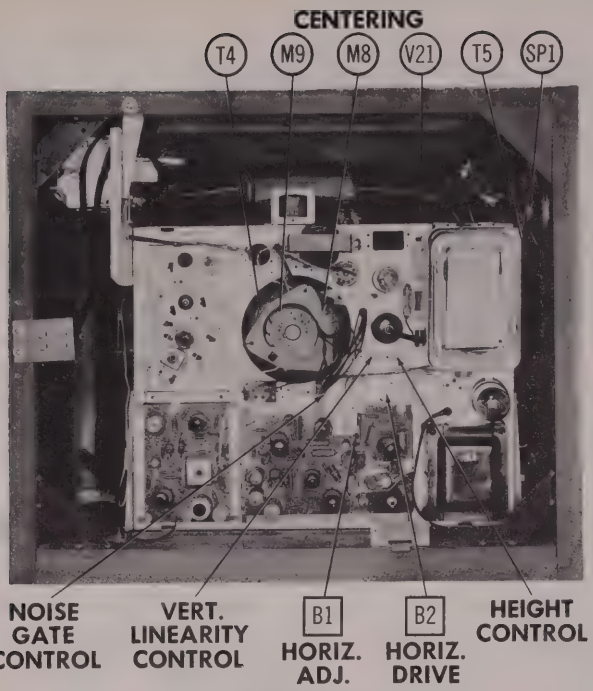


RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast for a normal picture.

3. Rotate the horizontal adjustment slug (B1) clockwise until the picture loses sync. It may be necessary to momentarily switch off channel and back again for the picture to lose sync.

4. Turn B1 slowly counter clockwise until the picture just falls into sync.

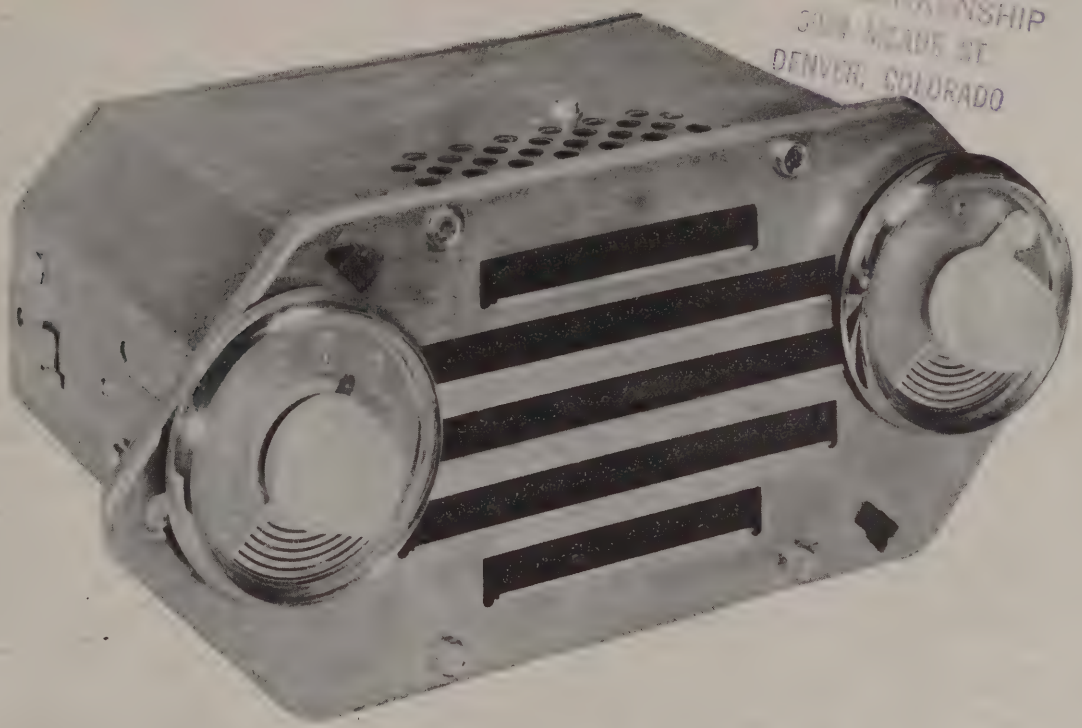
5. Turn to an unused channel. If vertical white lines appear near the center of the screen, slowly adjust the horizontal drive trimmer (B2) counter clockwise until the white lines disappear.

6. If in step 5 the horizontal drive was adjusted, tune in a station and repeat steps 3 and 4. Check the horizontal sync by switching off channel and back again.

AMERICAN MOTORS
MODEL 8990377 (6MR)

PROPERTY OF
L. F. BLANKENSHIP
3000 MEADE ST.
DENVER, COLORADO

AMERICAN MOTORS
MODEL 8990377 (6MR)



AMERICAN MOTORS
MODEL 8990377 (6MR)

TRADE NAME	American Motors Model 8990377 (6MR) (For 1956 Rambler Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det. -AVC-AF Amp., 12AB5 Output, 12X4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 2.2 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	To antenna receptacle thru dummy	1605KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal	"	A6	"
4.	"	"	600KC	Tune to 600KC signal	"	A7	Adjust for maximum output while rocking tuning gang.

WITH RECEIVER INSTALLED IN CAR AND ANTENNA FULLY EXTENDED, TUNE IN A WEAK STATION NEAR 1400KC AND ADJUST A6 FOR MAXIMUM VOLUME.

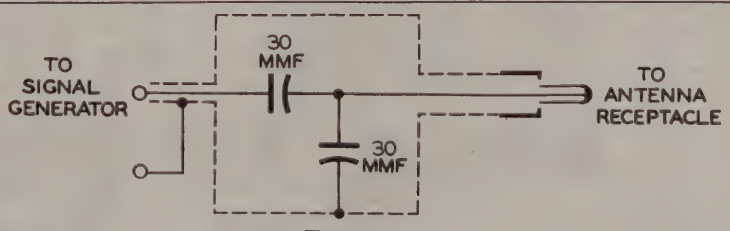


FIG. 1

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PARTS LIST AND DESCRIPTIONS

AMERICAN MOTORS
MODEL 8990377 (6MR)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	
V4	Output	12AB5	
V5	Rectifier	12X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 20	250	23A500059 (Note 1)	AFH3-14	C066	FP328	TMT72	T-330	TVL-3510
B	▲ 10	250	(Note 1)						
C	10	25	(Note 1)						

Note 1. In some versions, C1A is 15MFD and C1C is 20MFD (C1 Part No. 23A485677).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.05	200	8R121005	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C3	.05	200	8R121005	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C4	.01	400	8R121002	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C5	.02	200	8R121003	BPD-02	DF-203	CUB2S2	817-02	PT412	2TM-S2	
C6	.006	400	8R121001	SI-6000		CUB6D6	GP3-333-602	PT626	6TM-D6	
C7	.01	400	8R121002	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C8	470		21R410121	BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	
C9	.003	600	8R121569	DI-003	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C10	.05	600	8R122185	BPD-05	DF-503	CUB6S5		PT615	6TM-S5	
C11	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C12	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C13	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	1/2	18B536118	F1-51	RTV-587C		UE1657S	Tone (Panel)
B	500KΩ			R2-44				Volume (Rear) Tapped @ 100KΩ
C	Bushing			AK-26	XB-1			Attach to R1A.
D	Switch			KB-4				Attach to R1B.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

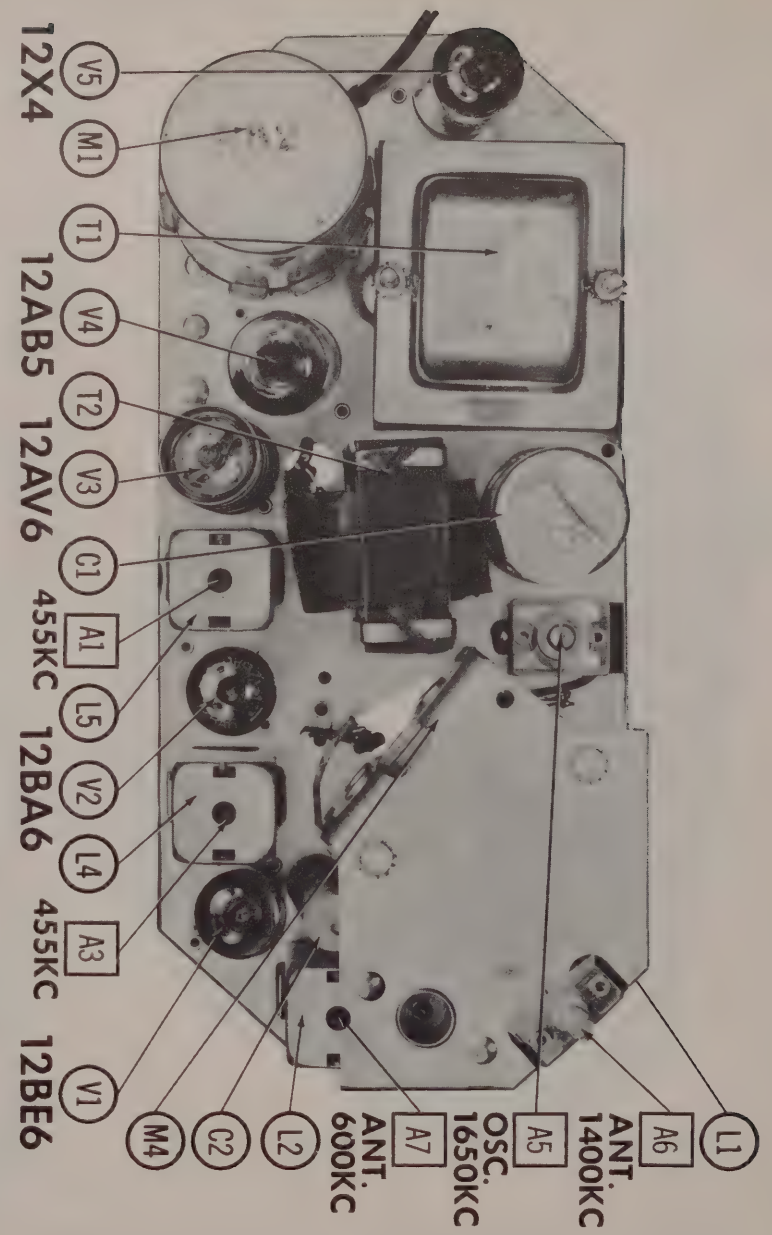
ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	IRC PART No.	NOTES
R2	33KΩ		6R6012	BTS-33K	
R3	1Meg		6R6004	BTS-1Meg	
R4	10KΩ	1	6R5570	BTA-10K	
R5	150Ω			BTS-150	Note 1
R6	18KΩ		6R5591	BTS-18K	
R7	6.8Meg		6R3987	BTS-6.8Meg	
R8	220KΩ		6R6015	BTS-220K	
R9	470KΩ		6R6032	BTS-470K	
R10	180Ω	1	6R6390	BTA-180	
R11	1500Ω	1	6R5700	BTA-1500	
R12	270KΩ			BTS-270K	Note 2

Note 1. Some versions use 82Ω in this application (Part No. 6R2035).
Note 2. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @ 1.1A	370VCT @ .047A			25C536265A					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6.4KΩ	3-4Ω	25K536116			A-3878①			① Fabricate mounting

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"x 6"	PM	3-4Ω	50C536495	46A1	227S1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Loading Coil	2.2Ω		24K592197				2.7 Microhenries; IRC Part No. CLA
L2	Ant. Coil	3.8Ω		24B591628				
L3	Osc. Coil	8.5Ω		24A591629				Tapped ⑨ .9Ω
L4	Input IF	22Ω	22Ω	24K533461	16-6758	BC-352	12-C1	
L5	Output IF	22Ω	22Ω	24K536450	16-6770	BC-355	12-C6	
L6	Fil. Choke	0Ω		24K510576				1.2 Microhenries
L7	Vib. Hash Choke	.2Ω		24A534494				21.2 Microhenries

VIBRATOR

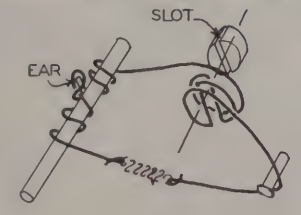
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA: MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	NOTES
M1	Interrupter	12.6V	115~	48B522000	6301	G8 59	6301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: MOTOROLA PART No. FUSE	MOTOROLA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	1AG	5A 32V	65R122345	9K536451	301005. (1AG5A)	155004	AGA5	HRF

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Scale	1B536278	Illuminated
M4	Tuning Cap.	19C535722	2 Gang (13-475MMF, 11-155MMF)
M5	Spark Plate	64K535152	
A5	Trimmer Cap.	20A536277	Osc. (12-40MMF)
A6	Trimmer Cap.	20B536117	Ant. (20-150MMF)
	Knob	36B536103	Tone
	Knob	36B536102	Tuning & On-Off-Volume
	Pointer	52B536115	Dial Scale

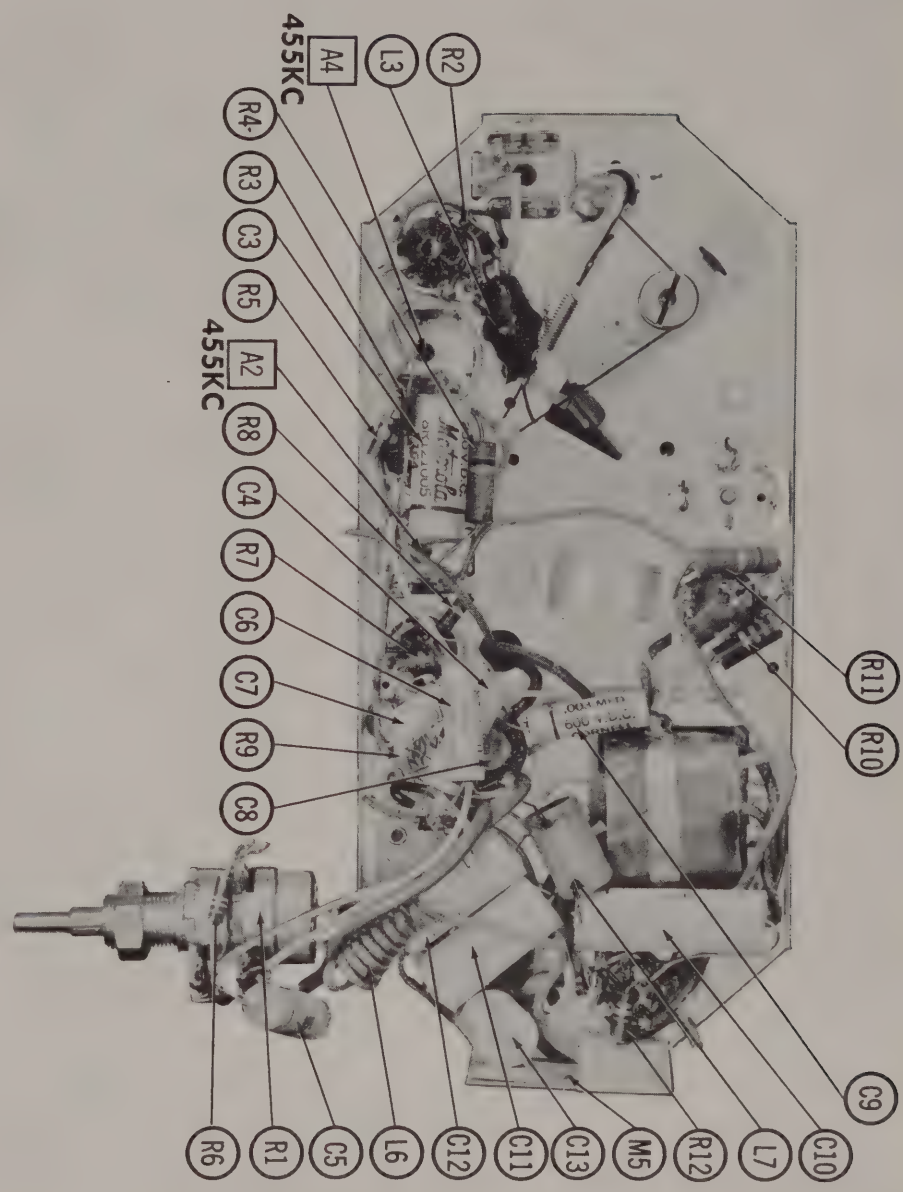


When restringing, ear should be at 90° to slot in pulley as shown.

TUNING GANG FULLY CLOSED

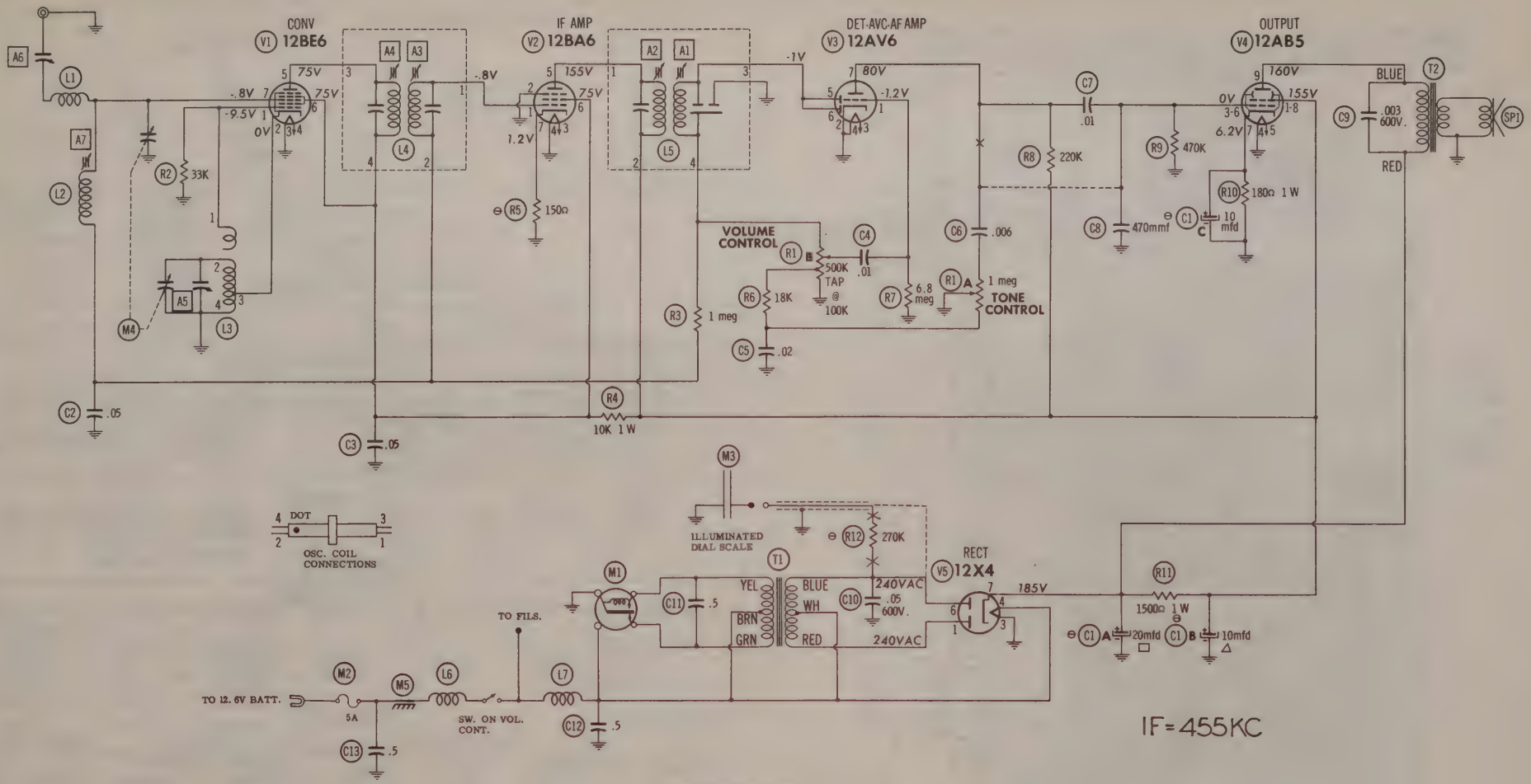
DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



AMERICAN MOTORS
MODEL 899377 (6MR)

AMERICAN MOTORS
MODEL 899377 (6MR)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BE6	33KΩ	.9Ω	0Ω	.1Ω	†11.5KΩ	†11.5KΩ	1.2Meg		
V2	12BA6	1.2Meg	0Ω	.1Ω	0Ω	†1.5KΩ	†11.5KΩ	150Ω		
V3	12AV6	6.8Meg	0Ω	.1Ω	0Ω	450KΩ	450KΩ	†220KΩ		
V4	12AB5	†1.5KΩ	TP	470KΩ	0Ω	.1Ω	470KΩ	180Ω	†1.5KΩ	†725Ω
V5	12X4	300Ω	TP	0Ω	.1Ω	NC	290Ω	22KΩ		

† MEASURED FROM PIN 7 OF V5.
TP-TIE POINT.
NC-NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT* Folder

*TRADE MARK

ANDREA MODELS C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21 (Ch. VP21)

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ANDREA MODEL CO-VP21

TRADE NAME	Andrea	MODELS	CHASSIS
		C-VP21 - New Hampton (Console)	VP21
		CO-VP21 - Newport (Modern Deluxe Combination)	VP21
		LB-VP21 - Monte Carlo (Lowboy)	VP21
		MC-VP21 - Catalina (Modern Console)	VP21
		T-VP21 - Hollywood (Table Model)	VP21
MANUFACTURER	Andrea Radio Corp., 27-01 Bridge Plaza North, Long Island City 1, N.Y.		
TYPE SET	TV-Radio-Phono Combination Receiver		
TUBES	(TV) Eighteen, (Radio) Six		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATINGS	(TV) 1.6 Amp. @ 117 Volts AC (Radio) .27 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) Radio Tuning AM 540-1650KC, AM IF 455KC, FM 88-108MC, FM IF 10.7MC		

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RECORD CHANGER - WEBCOR MODEL 141

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DATE 8-56 SET 326 FOLDER 4

ANDREA MODELS C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21 (Ch. VP21)

ANDREA MODELS C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21 (Ch. VP21)

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DISASSEMBLY INSTRUCTIONS

TV CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from front panel of cabinet.

2. Remove 10 wood screws. Remove rear cover.

3. Remove radio and phono power plugs, radio and phono input jacks and speaker leads.

4. Remove 4 speaker nuts. Remove large speaker.

5. Remove 4 chassis bolts. Remove chassis.

6. Remove 4 speaker nuts. Remove small speaker.

RADIO CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.

2. Remove 10 wood screws. Remove rear cover.

3. Remove radio power plug and input jack from TV chassis.

4. Remove 4 chassis bolts. Remove chassis.

MODELS	CHASSIS
C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21	VP21

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator adjustments, it is necessary to remove the chassis from the cabinet. (See alignment instructions on page 6).

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws holding wood molding at bottom edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the set. Adjustment is located on top of the chassis. Set the horizontal hold control to the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary slug (L12) located on top of the chassis.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

ANDREA MODELS C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21 (Ch. VP21)

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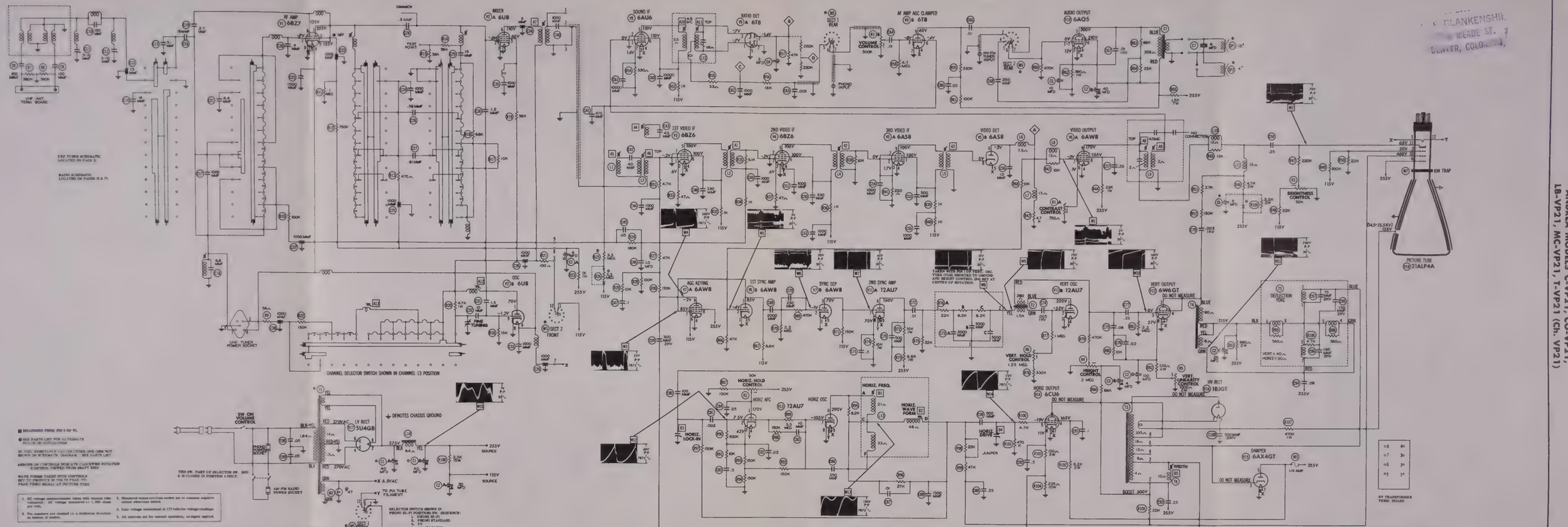
ANDREA MODELS C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21 (Ch. VP21)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
DENOTES CHASSIS GROUND
VHF ANT TERM. BOARD
UHF TUNER SCHEMATIC LOCATED ON PAGE 5.
RADIO SCHEMATIC LOCATED ON PAGES 10 & 11.
UHF TUNER POWER SOCKET
SW. ON VOLUME CONTROL
AM-FM RADIO POWER SOCKET
TO PIX TUBE FILAMENT
SELECTOR SWITCH SHOWN IN PHONO RS-P1 POSITION
SW. SEQUENCE:
1. PHONO RS-P1
2. PHONO STANDARD
3. TV
4. AM-FM RADIO
THIS SW. PART OF SELECTOR SW. (RS) & IS CLOSED IN POSITION 4 ONLY.
RF AMP
MIXER
OSC
SOUND IF
RATIO DET
AF AMP AGC CLAMPER
AUDIO OUTPUT
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO DET
VIDEO OUTPUT
AGC KEYING
1ST SYNC AMP
SYNC SEP
2ND SYNC AMP
VERT OSC
VERT OUTPUT
HORIZ HOLD CONTROL
HORIZ AFC
HORIZ OSC
HORIZ. FREQ.
HORIZ WAVE FORM
HORIZ OUTPUT
DAMPER
HV RECT
PICTURE TUBE
ION TRAP
BRIGHTNESS CONTROL
CONTRAST CONTROL
VOLUME CONTROL
VERT. HOLD CONTROL
VERT. LINEARITY CONTROL
HORIZ. DRIVE
WIDTH
BOOST
DEFLECTION YOKE
FINE TUNING
SECT 1 REAR
SECT 1 FRONT
SECT 2 FRONT
AM-FM TUNER INPUT
NO CONNECTION
DO NOT MEASURE
JUMPER
HV RECT 1B3GT
DAMPER 6AX4GT
LV RECT 5U4GB
HORIZ OUTPUT 6CU6
VERT OUTPUT 6W6GT
VERT OSC 12AU7
HORIZ OSC 12AU7
1ST SYNC AMP 6AW8
AGC KEYING 6AW8
SYNC SEP 6AW8
2ND SYNC AMP 12AU7
VIDEO OUTPUT 6AW8
VIDEO DET 6AS8
3RD VIDEO IF 6AS8
2ND VIDEO IF 6BZ6
1ST VIDEO IF 6BZ6
SOUND IF 6AU6
RF AMP 6BZ7
OSC 6UB
MIXER 6U8
AUDIO OUTPUT 6AQ5
RATIO DET 6T8
AF AMP AGC CLAMPER 6T8
MEASURED FROM PIN 3 OF W1.
SEE PARTS LIST FOR ALTERNATE RESISTOR SPECIFICATIONS
DC VOLT. RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. SEE PARTS LIST.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK TO-PEAK VIDEO SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 cycles per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative tuner chassis unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
PAGE 2

TV CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ANDREA MODELS C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21 (Ch. VP21)

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ANDREA MODELS C-VP21, CO-VP21,
LB-VP21, MC-VP21, T-VP21 (Ch. VP21)
TV CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PAGE 4

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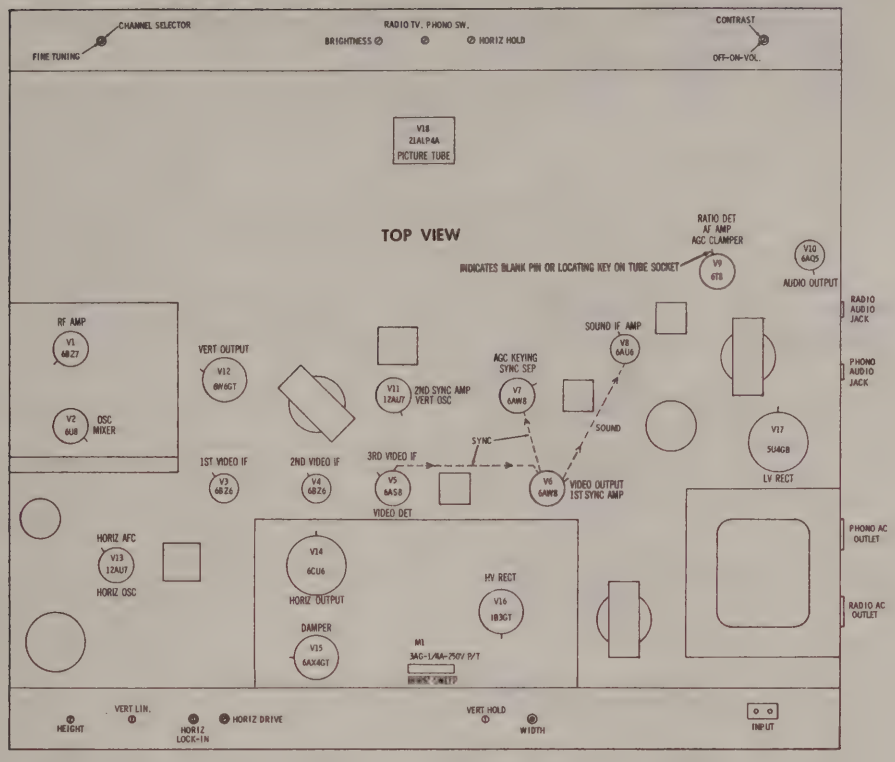
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V18
Has pic, no sound - V6, V9, V10
Overloaded picture - V7, V9

SYNC FAILURE
No vert. sync - V11
No horiz. sync - V11, V13
No vert. or horiz. sync - V6, V7, V11

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V18, Fuse (M1)
No vertical deflection - V11, V12
Poor vert. linearity or foldover - V11, V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, V17
Vert. off freq. - V11
Horiz. off freq. - V11, V13

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from chassis.

VIDEO IF ALIGNMENT

Connect the negative side of a 4.5 volt bias supply to the ungrounded side of C46. Connect the positive side to chassis.
Remove the Keyed AGC tube (V7) from its socket.
Attenuate the sweep generator output to maintain 2 to 3 volts peak to peak on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of First Video IF Amp. (V3). Low side to chassis.	44MC (10MC Swp.)	45.75MC 42.5MC	Between any two channels	Vert. amp. to point (A). Low side to chassis.	A1, A2, A3	Disconnect L33 from pin 1 (grid) of V3. Adjust A1 to place 45.75MC marker at 50% on high frequency side of response curve. See Fig. 1. Adjust A2 for correct bandwidth with maximum gain. 42.5MC marker should be at 75%. Check position of 45.75MC marker. If necessary, retouch A1. If two peaks are obtained when adjusting A1 and A2 use peak obtained with slug nearest chassis. Adjust A3 for MINIMUM tilt after A1 and A2 are properly adjusted. Reconnect lead of L33 to pin 1 of V3.
2.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	"	41.25MC	"	"	A4	Adjust A4 for proper position of the 41.25MC marker as in Fig. 1.
3.	"	"	"	47.25MC	"	"	A5	Adjust for proper position of 47.25MC marker as in Fig. 1.
4.	"	"	"	45.75MC 42.5MC	"	"	A6	Adjust A6 for MINIMUM tilt.
5.	"	"	"	41.25MC	"	"	A7	Adjust A7 until the 41.25MC marker is not more than 1% of the overall response as in Fig. 1.
6.	"	"	"	45.75MC 42.5MC 41.25MC	"	"		Check for response curve similar to Fig. 1. If necessary, retouch A1 thru A3 for desired response. A1 affects 45.75MC marker. A2 affects low frequency side and position of 42.5MC marker and A3 affects tilt. Replace V7 in its socket.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 220K resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (grid) of Video Output Tube (V6A). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point (B). Common to chassis.	A8, A9, A10	Adjust for maximum deflection. Attenuate output on VTVM for approximately 40 volts by varying setting of contrast control.
8.	"	"	"	"	DC probe to point (C). Common to point (D).	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (grid) of Video Output Tube (V6A). Low side to chassis.	4.5MC (450KC Swp.)	4.5MC	Any non-interfering channel	Vert. amp. to point (B). Low side to chassis.	A8, A9, A10	Disconnect stabilizing capacitor (C4). Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
8.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A11	Reconnect C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

VHF OSCILLATOR ADJUSTMENT

Set the fine tuning control to the center of its range. Set the channel selector switch to the highest high band (7-13) station operating in the area. Adjust the high band oscillator adjustment (A12) for best picture detail.
Set the channel selector switch to the highest low band channel (2-6) operating in the area. Adjust the low band oscillator adjustment (A13) for best picture detail. Recheck the setting of A12 and if it has changed repeat entire procedure.

UHF-VHF RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver have been properly aligned at the factory and are very stable. Alignment of this portion should not be required in the field.

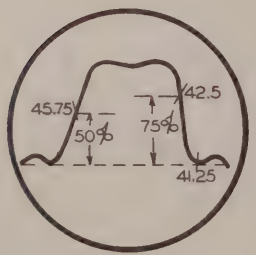


FIG. 1

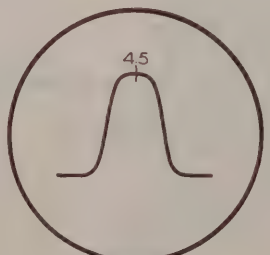


FIG. 2

FIG. 3

RADIO ALIGNMENT INSTRUCTIONS

AM RADIO ALIGNMENT

Use an isolation transformer to protect the test equipment.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	.01MFD	High side to pin 7 (grid) of converter tube (V20). Low side thru .1MFD to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across Voice Coil	A14, A15 A16, A17	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
10.	Direct	High side to external antenna lead. Low side thru .1MFD to chassis.	1650KC (400∿ Mod.)	"	1650KC	"	A18	"
11.	"	"	1400KC (400∿ Mod.)	"	Tune to 1400KC signal	"	A19	Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Use an isolation transformer to protect the test equipment.
Connect two matched 100KΩ (±5%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓑ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
12.	.01MFD	High side to pin 7 (grid) of 12AT7 (V20). Low side to chassis thru .1MFD.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A20, A21 A22, A23, A24	Adjust for maximum deflection.
13.	"	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓑ.	A25	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use an isolation transformer to protect the test equipment.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
12.	.01MFD	High side to pin 7 (grid) of 12AT7 (V20). Low side thru .1MFD to chassis.	10.7MC (450KC Swp.)	FM	Tuning gang fully open	Vert. amp. to point Ⓐ. Low side to chassis.	A20, A21, A22, A23, A24	Disconnect stabilizing capacitor C102. Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
13.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A25	Reconnect C102. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 5. SLIGHTLY retouch A24 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Use an isolation transformer to protect the test equipment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each lead.	108MC (Unmod.)	FM	108MC	DC probe to point Ⓐ. Common to chassis.	A26	Adjust for maximum deflection.
15.	"	"	105MC (Unmod.)	"	Tune to 105MC signal	"	A27	"
16.	"	"	100MC (Unmod.)	"	Tune to 100MC signal	"	A28	"

FIG. 4

FIG. 5

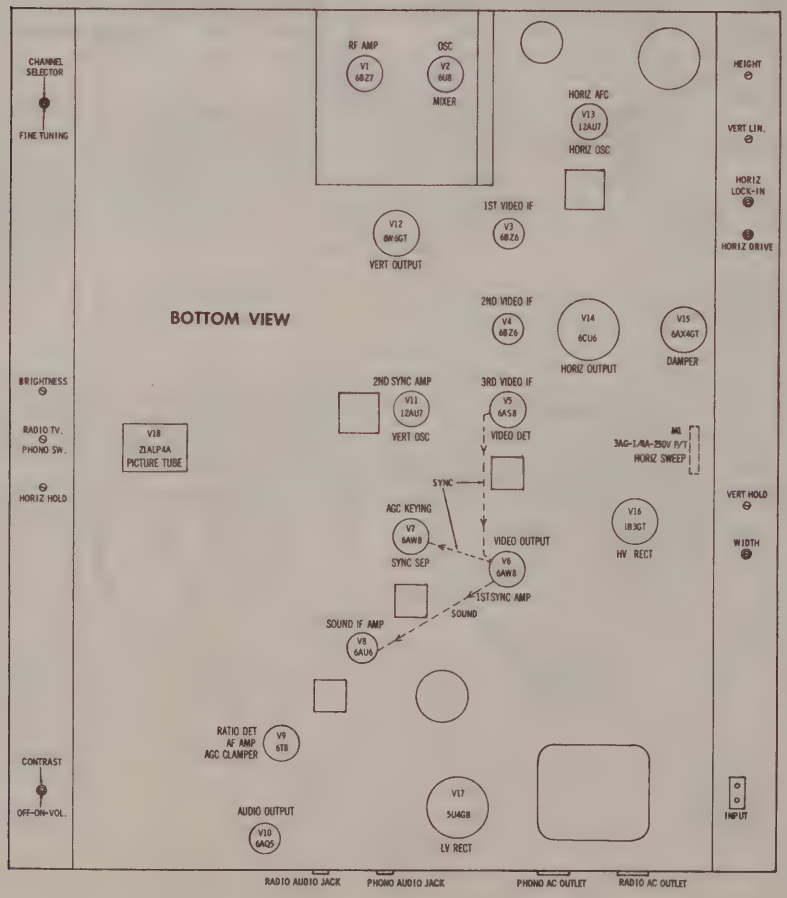
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ7	† 1.5KΩ	400KΩ	INF	.1Ω	0Ω	INF	400KΩ	0Ω	0Ω
V2	6U8	† 7.5KΩ	100KΩ	† 56KΩ	.1Ω	0Ω	† 2.6KΩ	0Ω	0Ω	15KΩ
V3	6BZ6	150KΩ	47Ω	0Ω	.1Ω	† 3.5KΩ	† 3.5KΩ	0Ω		
V4	6BZ6	150KΩ	47Ω	0Ω	.1Ω	† 3.5KΩ	† 3.5KΩ	0Ω		
V5	6AS8	† 4.5KΩ	.1Ω	220Ω	0Ω	.1Ω	4.7KΩ	220Ω	.1Ω	† 4.5KΩ
V6	6AW8	0Ω	11KΩ	† 9.5KΩ	0Ω	.1Ω	5Ω	4.7KΩ	† 33KΩ	† 4.7KΩ
V7	6AW8	0Ω	2.7Meg	† 150KΩ	0Ω	.1Ω	† 2.5KΩ	† 9.5KΩ	† 64Ω	250KΩ
V8	6AU6	2Ω	0Ω	0Ω	.1Ω	† 3.5KΩ	† 3.5KΩ	330Ω		
V9	6T8	500KΩ	47KΩ	500KΩ	.1Ω	0Ω	300KΩ	0Ω	4.7Meg	† 430KΩ
V10	6AQ5	470KΩ	390Ω	0Ω	.1Ω	† 1.9KΩ	† 1.5KΩ	470KΩ		
V11	12AU7	¶ 800KΩ	1.5Meg	0Ω	0Ω	0Ω	† 17KΩ	† 150KΩ	10KΩ	.1Ω
V12	6W6GT	NC	0Ω	† 900Ω	† 900Ω	2.2Meg	NC	.1Ω	900Ω	
V13	12AU7	† 30KΩ	850KΩ	300KΩ	0Ω	0Ω	¶ 70KΩ	300KΩ	0Ω	.1Ω
V14	6CU6	TP	0Ω	TP	† 8.2KΩ	470KΩ	TP	.1Ω	100Ω	TOP CAP ¶ 19Ω
V15	6AX4GT	NC	NC	1Meg	NC	† 64Ω	TP	.1Ω	0Ω	
V16	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ¶ 354Ω
V17	5U4GB	TP	50KΩ	NC	15Ω	NC	14Ω	NC	50KΩ	
V18	21ALP4A	.1Ω	† 40KΩ	PIN 6 † 64Ω	PIN 10 ¶ 22KΩ	PIN 11 † 250KΩ	PIN 12 0Ω			

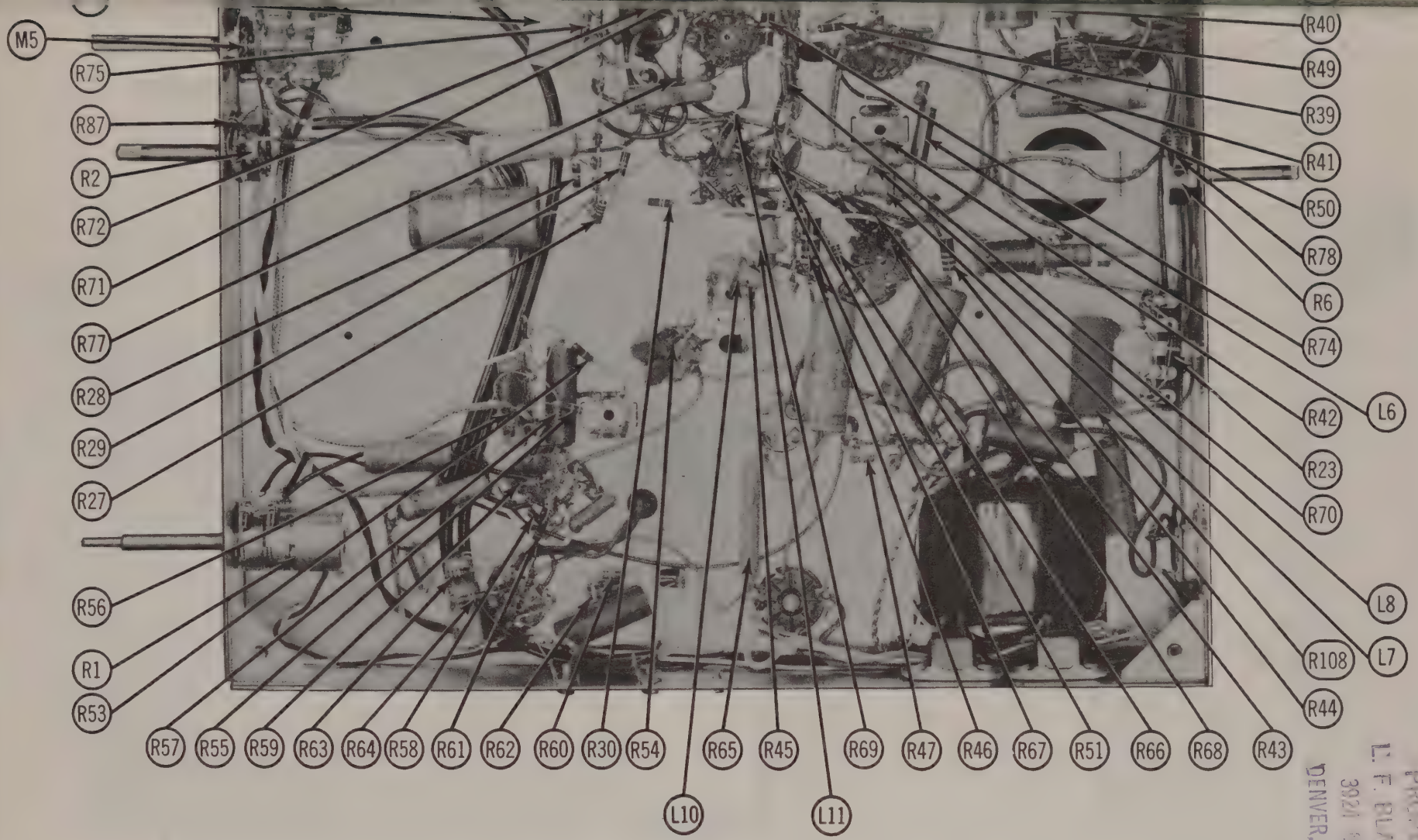
ALL MEASUREMENTS TAKEN IN "TV" POSITION UNLESS OTHERWISE DESIGNATED.

† MEASURED FROM PIN 2 OF V17.

¶ MEASURED FROM PIN 3 OF V15.



TUBE PLACEMENT CHART



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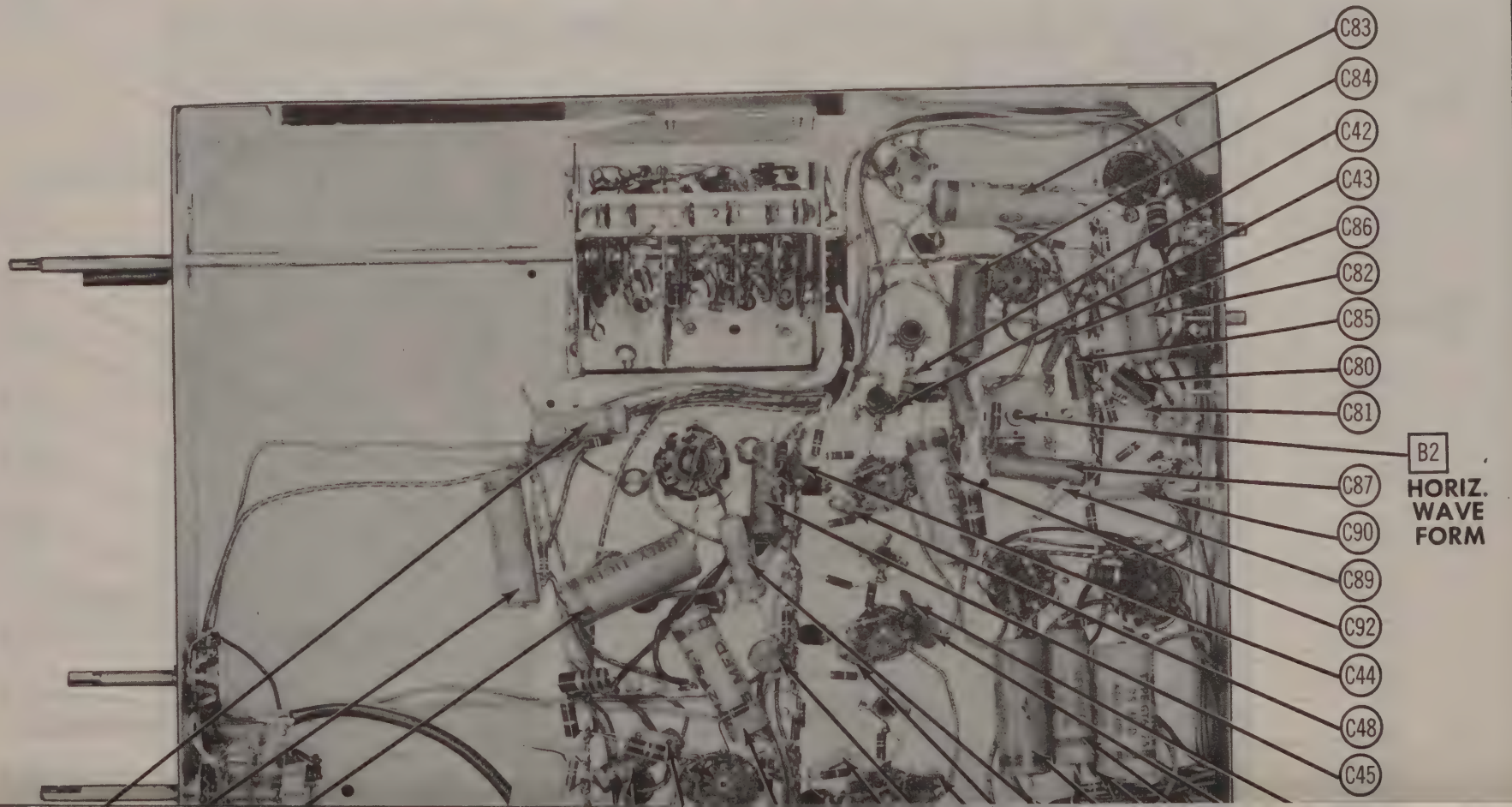
TV CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION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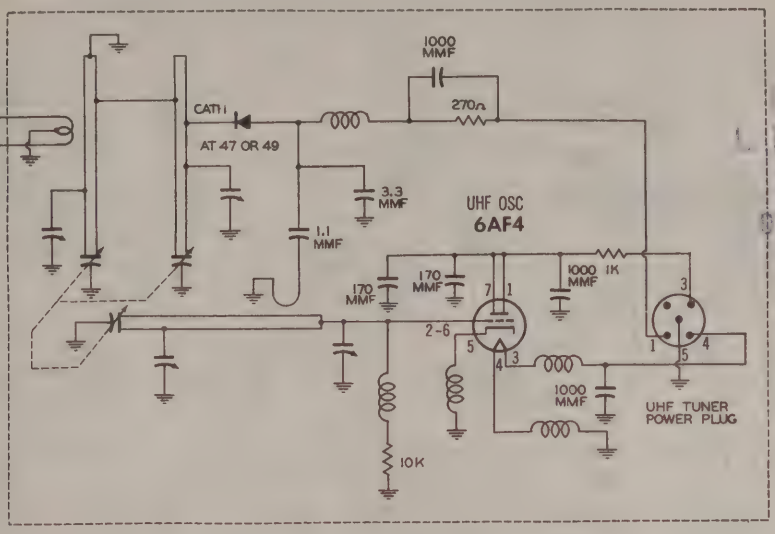

UHF TUNER PART NO. FM-5344U USED WITH UHF MODELS

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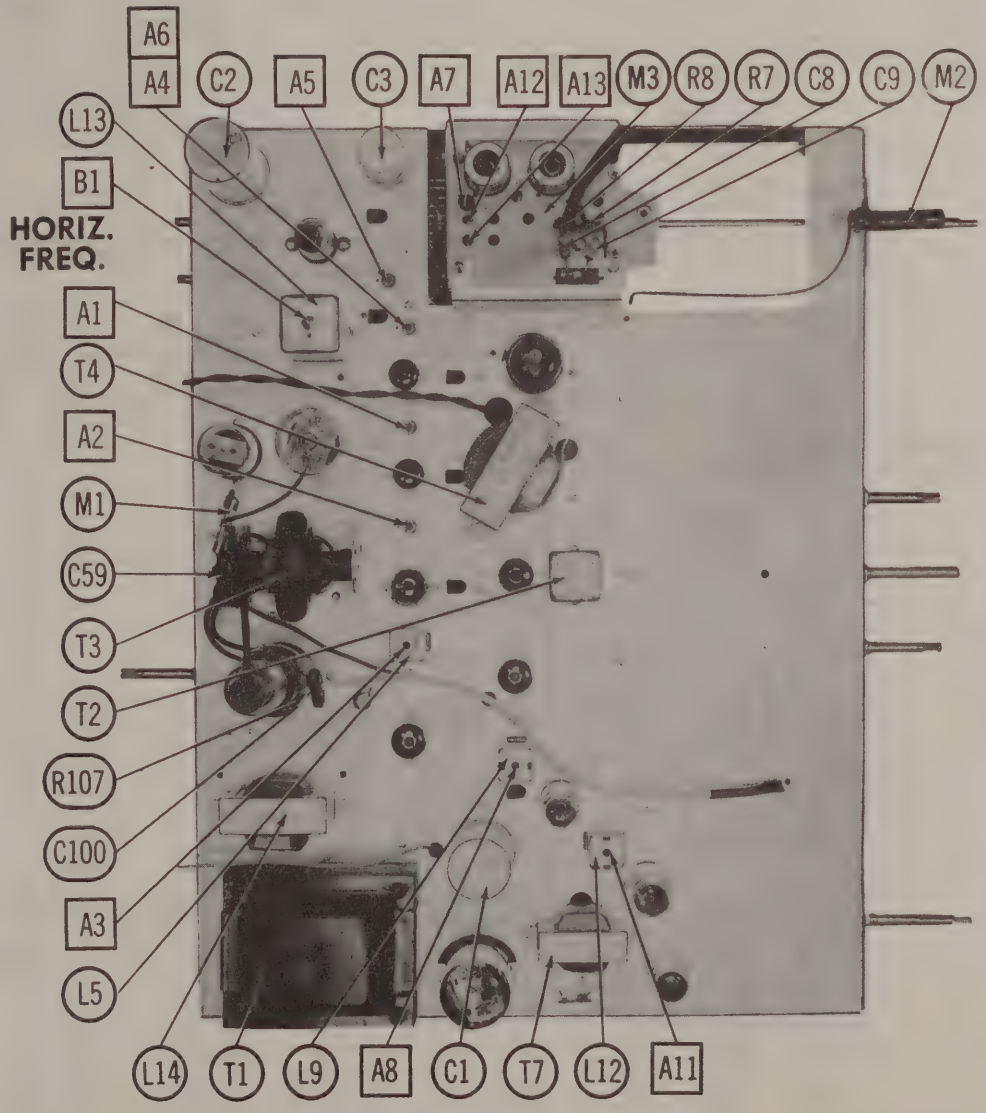
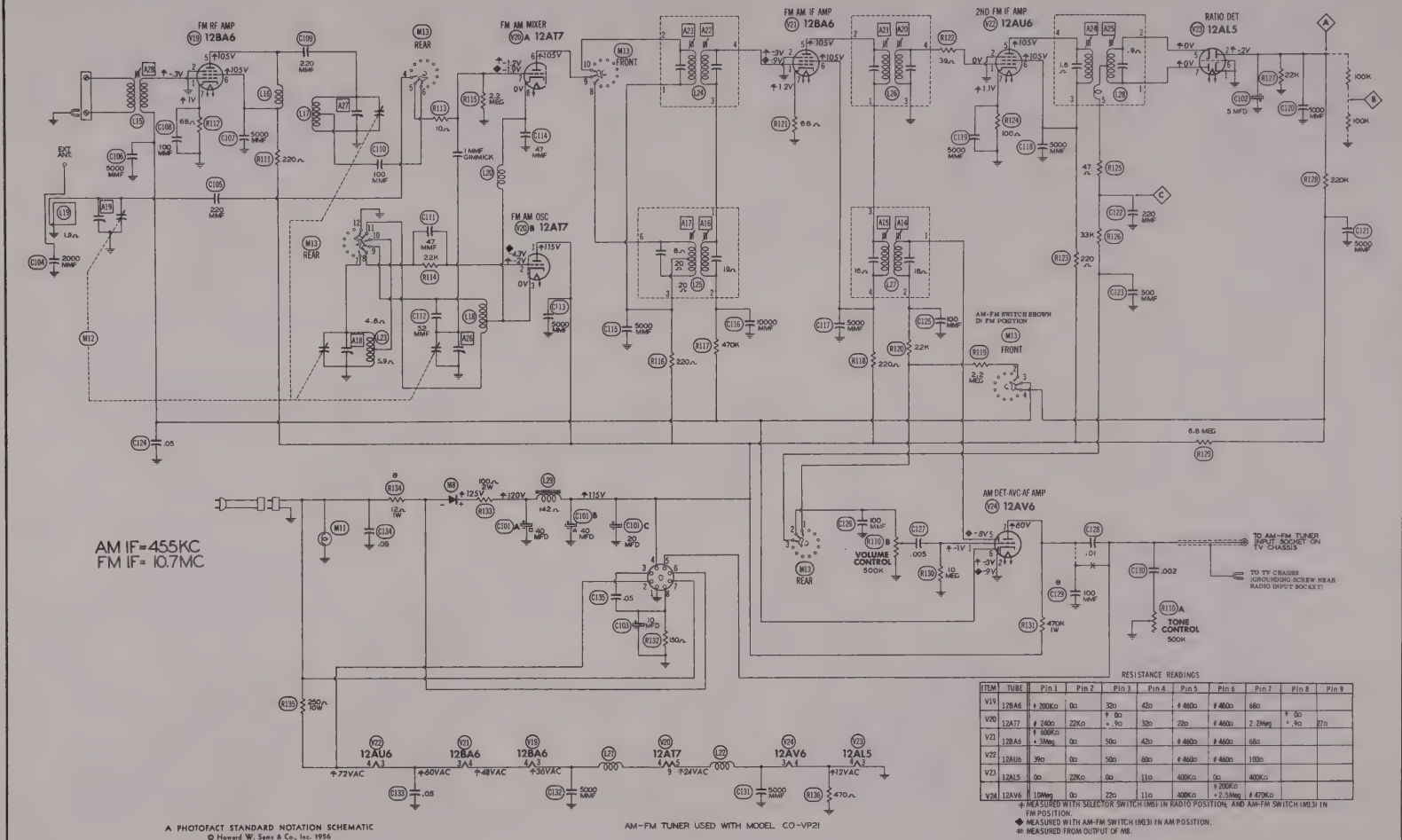
UHF TUNER SCHEMATIC



TV CHASSIS TOP VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V19	12BA6	† 200Ko	0Ω	32Ω	42Ω	# 460Ω	# 460Ω	68Ω		
V20	12AT7	# 240Ω † 600Ko	22Ko	† 0Ω + .9Ω	32Ω	22Ω	# 460Ω	2.2Meg	† 0Ω + .9Ω	27Ω
V21	12BA6	+ 3Meg	0Ω	50Ω	42Ω	# 460Ω	# 460Ω	68Ω		
V22	12AU6	39Ω	0Ω	50Ω	68Ω	# 460Ω	# 460Ω	100Ω		
V23	12AL5	0Ω	22Ko	0Ω	11Ω	400Ko	0Ω + 200Ko	400Ko		
V24	12AV6	10Meg	0Ω	22Ω	11Ω	400Ko	+ 2.5Meg	# 470Ko		

+ MEASURED WITH SELECTOR SWITCH (M6) IN RADIO POSITION, AND AM-FM SWITCH (M13) IN FM POSITION.
◆ MEASURED WITH AM-FM SWITCH (M13) IN AM POSITION.
MEASURED FROM OUTPUT OF M8.

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AM-FM TUNER USED WITH MODEL CO-VP21

RADIO SCHEMATIC

TV PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BZ7	
V2	Mixer-Oscillator	6U8	
V3	1st. Video IF Amplifier	6BZ6	
V4	2nd. Video IF Amplifier	6BZ6	
V5	3rd. Video IF Amplifier-Video Detector	6AS8	
V6	Video Output-1st. Sync Amp.	6AW8	
V7	AGC Keying-Sync Separator	6AW8	
V8	Sound IF Amplifier	6AU6	
V9	Ratio Detector-AF Amplifier AGC Clamper	6T8	
V10	Audio Output	6AQ5	
V11	2nd. Sync Amplifier-Vert. Oscillator	12AU7	
V12	Vert. Output	6W6GT	
V13	Horiz. AFC-Horiz. Osc.	12AU7	
V14	Horiz. Output	6CU6	
V15	Damper	6AX4GT	
V16	HV Rectifier	1B3GT	
V17	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	ANDREA PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V18	21ALP4A①	21ALP4A ① 21ALP4B①	21ALP4A ① 21ALP4A/B ①	21ALP4A/B ②	① Aluminized ② Silver screen "85"
		21ALP4	21ALP4		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ANDREA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450	HCE-1340 (Note 1)	AFH2-57	B045	FP238	TM-D40-450	D-235	TVL-2764
B	▲40	450	(Note 1)						
C2A	▲20	350	HCE-1339	RE1013		FP436 TC68	TM-4104	Q-395 MT-4520	R1528 †
B	■40	450							
C	▲20	525							
D	100	25							
C3A	■4	500	HCE-1341	AFH2-67			TM-D10-500	T-200	R2033 †
B	▲4	500							
C4	2	50	HCE-1342	PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301
C5	10	25	HCE-1329	PRS25V10	BR102	TC22	TD-10-25	FM-0210	TVA-1204
C6	8	450	(Note 2)						
C7	6	10VAC	HCE-1343	PRS10VAC5	BR105 * BR105	TC22 * TC22		MMT-0210 * MMT-0210	R2235 †

Note 1. C1 is a dual 80MFD in versions designed for 50 cycle power operation.
Note 2. Used only in versions designed for 50 cycle power operation.
* Connect negative leads together.
† Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ANDREA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C8	100			SI100	D6-100	TP34	GP1K-101	UC-531	5GA-T1	
C9	100			SI100	D6-100	TP34	GP1K-101	UC-531	5GA-T1	
C10	150			BPD-00015	DD-151	G046	811-151	UC-5315	5GA-T15	
C11	5-10				829-10					
C12	5-10				829-10					
C13	15									
C14	18			DI-000018	D6-180	G022	831-180	UC-5418	5GA-Q18	
C15	5.1									
C16	15			BPD-000015	DD-150	G021	831-150	UC-5415	5GA-Q15	
C17	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C18	6.8			NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C19	2.7									
C20	4					Z009				
C21	6.8			NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C22	1000			EF-001	MFT-1000				503C-D1	
C23	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C24	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C25	1000			EF-001	MFT-1000				503C-D1	
C26	.56									
C27	.91									
C28	.3									
C29	15			NP0-DI15	TCZ-15	Z021	NP0K-150		5TCC-Q15	
C30	1.2									
C31	1.5									
C32	10			NP0-DI10	TCZ-10	Z018	NP0A-100	ZT-541	5TCC-Q1	
C33	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C34	5									
C35	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	1000			EF-001	MFT-1000				503C-D1	
C37	1000			EF-001	MFT-1000				503C-D1	
C38	1000			EF-001	MFT-1000				503C-D1	
C39	1000			EF-001	MFT-1000				503C-D1	
C40	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C41	470		HCC-1935	SI470	D6-471	K060	811-471	UC-5347	5GA-T47	
C42	40		HCC-1907							
C43	43				TCZ-43	TZ21	NP0L-430		MS-443	
C44	1000		HCC-1950	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C45	.05	400	HCT-1003	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C46	1.0	100	HCT-1207-1	P288N-1.0		ST4W1		PT41	2TM-M1	
C47	.1	200	HCT-1013	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C48	330		HCC-1937	SI330	D6-331	TP43	811-331	UC-5333	5GA-T33	
C49	1000		HCC-1950	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C50	330		HCC-1937	SI330	D6-331	TP43	811-331	UC-5333	5GA-T33	
C51	1000		HCC-1950	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C52	1000		HCC-1950	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C53	500	500	HCM-1625A	SI500	D6-501	TP47	811-501	MCB245	MS-35	
C54	1000		HCC-1950	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C55	1000		HCC-1950	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C56	10		HCC-1923	N750-SI10	TCN-10	TN01	N750A-100	NT-541	5TCU-Q1	
C57	.25	400	HCT-1015	P488N-25		CUB4P25		PT402	4TM-P25	
C58	.25	400	HCT-1015	P488N-25		CUB4P25		PT402	4TM-P25	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ANDREA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C59	300	2000	HCM-1616C2K	1467LS-HV-300	DD30-301	5P15T3		MCL330	20GA-T3	
C60	10000		HCC-1943	BPD-01	DD-103	K082	811-01	DC-511	5HK-81	
C61	10000		HCC-1943	BPD-01	DD-103	K082	811-01	DC-511	5HK-81	
C62	1000		HCC-1950	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C63	.005	600	HCT-1017	BPD-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C64	.01	600	HCT-1008	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C65	.01	600	HCT-1001	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C66	.05	400	HCT-1003	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C67	.01	1000	HCT-1009	P1088N-01	DD-103	CUB16S1		PT1611	10TM-S1	
C68	250	500		SI250	DD-251	5W5T25	811-251	MC240	1FM-325	
C69	2000		HCC-1944	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C70	250	500	HCM-1624C	SI250	D6-251	22R5T25	811-251	MCB240	MS-325	
C71	.5	200	HCT-1033	P288N-5		CUB2P5		PT405	2TM-P5	
C72	.01	200	HCT-1008	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C73A	2000									
B	5000		†FM-5289	†PA-110	†PC-100	†115TM1	†1405-01		†V-1	
C	5000									
C74	.005	1000	HCT-1035							
C75	.08	600	HCT-1029							
C76	.02	600	HCT-1030	BPD-02	DF-203	CUB6S2	817-02	PT612	6TM-S2	
C77	.25	400	HCT-1015	P488N-25		CUB4P25		PT4025	4TM-P25	
C78	.003	1000	HCT-1021	HVD-15-3300	DD-302	CUB16D3		PT1623	10TM-D3	
C79	500	500	HCM-1625A			5R5T5	811-501	MCB245	MS-35	
C80	100	500	HCM-1601A	NP0-SI100	TCZ-100	22R5T1	801-101	MCB235	MS-31	
C81	.002	600	HCT-1036	BPD-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C82	.02	600	HCT-1030	BPD-02	DF-203	CUB6S2	817-02	PT612	6TM-S2	
C83	.5	200	HCT-1033	P288N-5		CUB2P5		PT405	2TM-P5	
C84	.05	400	HCT-1003	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C85	10	500	HCM-1629A	NP0-SI10	TCZ-10	22R5Q1	831-100	MCB215	MS-41	
C86	250	500	HCM-1624C	1469-00025	TCZ-250	22R5T25	811-251	MCB240	MS-325	
C87	.01	600	HCT-1008	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C88	.25	600	HCT-1016	P688N-25		CUB6P25		PT6025	6TM-P25	
C89	1500	500	HCM-1618A	BPD-0015	DD-152	IW5D15	811-152	MC256	1FM-215	
C90	500	500	HCM-1625A	SI500	DD-501	5W5T5	GP2K-501	MC245	MS-35	
C91	.1	600	HCT-1002	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C92	.5	200	HCT-1033	P288N-5		CUB2P5		PT405	2TM-P5	
C93	.25	400	HCT-1015	P488N-5		CUB4P25		PT4025	4TM-P25	
C94	.08	600	HCT-1029							
C95	150	2000	HCM-1634	HVD-30-150	DD30-151	5P25T15	3KV-151	MCL315	20GA-T15	
C96	150	2000	HCM-1634	HVD-30-150	DD30-151	5P25T15	3KV-151	MCL315	20GA-T15	
C97	75	2000	HCM-1635	1468LS-HV-75	DD30-75	5P25Q75			20GA-Q75	
C98	.05	400	HCT-1003	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C99	.05	400	HCT-1003	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C100	500	20000	HCH-2706-1	UV-502	TV-207	MMU20T5	413-204	HV-20035A	20DK-T5	

† Items C73A, C73B, C73C, R76A, R76B and R76C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ANDREA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750Ω	½	GRV-845	F3-2	RTV-546	* QJ-871	UF13R	Contrast (Panel)
B	500KΩ	½		R2-41			UR55A	Volume (Rear)
C	Switch			KB-1			US-26	Attach to R1B.
R2A	50KΩ	½	GRV-847	AB-31	A47-50K-S	Q11-123	U-35	Horiz. Hold
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R2A.
R3A	50KΩ	½	GRV-847	AB-31	A47-50K-S	Q11-123	U-35	Brightness
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R3A.
R4A	2Meg	½	GRV-844	AB-75	A47-2Meg-S	Q11-139	TA26L	Height
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R4A.
R5A	1000Ω	2	GRV-849	VK-129	A43-1000	WPS-1000	R1000L	Vert. Linearity Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R5A.
R6A	1.25Meg	½	GRV-846	AB-742	A47-1.5Meg-S	Q11-138	U-155	Vert. Hold
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R6A.

* Concentrikit Equivalent, K-4 Kit, Base Elements and Shafts; B17-105 & P6-130 (Panel) B13-133 & R1-220 (Rear) 76-1 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ANDREA PART No.	IRC PART No.	NOTES
R7	560KΩ			BTS-560K	
R8	560K Ω			BTS-560K	
R9	56Ω			BTS-56	
R10	100KΩ			BTS-100K	
R11	1Meg 5%			BTS-1Meg 5%	
R12	750KΩ 5%			BTS-750K 5%	
R13	470Ω			BTS-470	
R14	56KΩ			BTS-56K	
R15	56KΩ			BTS-56K	
R16	15KΩ				
R17	10KΩ			BTS-10K	
R18	6800Ω				
R19	56KΩ			BTS-56K	
R20	4700Ω	1		BTA-4700	
R21	100Ω			BTS-100	
R22	150KΩ			BTS-150K	
R23	1000Ω	1	GRC-231	BTA-1000	
R24	180KΩ		GRC-336	BTS-180K	
R25	3. 3Meg			BTS-3. 3Meg	Note 1
R26	3. 3Meg			BTS-3. 3Meg	Note 2
R27	47KΩ		GRC-207	BTS-47K	
R28	100KΩ		GRC-258	BTS-100K	
R29	10KΩ		GRC-304	BTS-10K	
R30	150KΩ		GRC-243	BTS-150K	
R31	4700Ω		GRC-205		
R32	1000Ω		GRC-210	BTS-1000	
R33	47Ω		GRC-211	BTS-47	
R34	1000Ω		GRC-332	BTS-1000	
R35	9100Ω 5%		GRC-335		
R36	1000Ω		GRC-210	BTS-1000	
R37	47Ω		GRC-211	BTS-47	
R38	10KΩ		GRC-304		
R39	1000Ω		GRC-210	BTS-1000	
R40	1000Ω		GRC-332	BTS-1000	
R41	220Ω		GRC-218	BTS-220	
R42	4700Ω		GRC-205	BTS-4700	
R43	10KΩ		GRC-304	BTS-10K	
R44	33KΩ	1	GRC-281	BTA-33K	
R45	10KΩ		GRC-304	BTS-10K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ANDREA PART No.	IRC PART No.	NOTES
R46	4700Ω	2	GRC-236	BTB-4700	
R47	220KΩ		GRC-270	BTS-220K	
R48	22KΩ		GRC-201	BTS-22K	
R49	100KΩ		GRC-258	BTS-100K	
R50	22KΩ		GRC-201	BTS-22K	
R51	27KΩ		GRC-324	BTS-27K	
R52	150KΩ		GRC-243	BTS-150K	
R53	1000Ω		GRC-210	BTS-1000	
R54	330Ω		GRC-329	BTS-330	
R55	33Ω		GRC-289	BTS-33	
R56	18KΩ		GRC-330	BTS-18K	
R57	47KΩ		GRC-207	BTS-47K	
R58	4. 7Meg		GRC-242	BTS-4. 7Meg	
R59	330KΩ		GRC-301	BTS-330K	
R60	470KΩ		GRC-228	BTS-470K	
R61	100KΩ		GRC-258	BTS-100K	
R62	390Ω	1	GRC-277	BTA-390	
R63	68KΩ			BTS-68K	
R64	22KΩ			BTS-22K	
R65	1500Ω	7	GRW-542	PW7-1500	
R66	47KΩ		GRC-207	BTS-47K	
R67	6800Ω		GRC-221	BTS-6800	
R68	10KΩ		GRC-304	BTS-10K	
R69	470KΩ		GRC-228	BTS-470K	
R70	2. 2Meg		GRC-230	BTS-2. 2Meg	
R71	150KΩ		GRC-243	BTS-150K	
R72	10KΩ	1	GRC-232	BTA-10K	
R73	6800Ω	1	GRC-318	BTA-6800	
R74	10KΩ	1	GRC-232	BTA-10K	
R75	22KΩ		GRC-201	BTS-22K	
R76A	22KΩ			BTS-22K	
B	8200Ω		† FM-5289	BTS-8200	
C	8200Ω			BTS-8200	
R77	1Meg		GRC-311	BTS-1Meg	
R78	330KΩ		GRC-301	BTS-330K	
R79	470KΩ		GRC-228	BTS-470K	
R80	10KΩ		GRC-304	BTS-10K	
R81	2. 2Meg		GRC-230	BTS-2. 2Meg	
R82	330Ω	2	GRC-301	BTB-330	

TV PARTS LIST AND DES

RESISTOR

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ANDREA PART No.	IRC PART No.	NOTES
R83	680Ω	2	GRC-334	BTB-680	
R84	68KΩ		GRC-204	BTS-68K	
R85	560Ω		GRC-250		
R86	560Ω		GRC-250		
R87	100KΩ		GRC-258		
R88	150KΩ		GRC-243		
R89	3. 3Meg		GRC-206		
R90	820KΩ		GRC-246		
R91	10KΩ		GRC-304		
R92	150KΩ		GRC-243		
R93	150KΩ		GRC-243		
R94	150KΩ		GRC-243		
R95	8200Ω		GRC-285		
R96	27KΩ		GRC-324		

Note 1. Some versions use a 4. 7Meg
Note 2. Not used in some versions.
Note 3. Used in 50 cycle models only.
† Items R76A, R76B, R76C, C73A, C73

TRANSFORMER

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	ANDREA PART No.
T1	117VAC	540VCT	5V	6. 3V	ST-3062
	③ L 61A	③ .240A	③ 3A	③ 9. 1A	ST-3069 ①

① For 50 cycle operation.

TRANSFORMERS (SW

ITEM No.	USE	ANDREA PART No.	Halldorson PART No.	Merit PART No.
T2	Vert. Osc. Trans.	ST-3068	B6701	A-4003
T3	Horiz. Output Trans.	ST-3063	FB419 * ①	HVO-36 * ①
T4	Vert. Output Trans.	ST-3064	Z1900 ②	A-2822
T5A	Yoke(90°)Horiz.(19MH)	S-144 ③	DF607 ⑤	MDF-92
B	Vert. (40MH)	ST-3066A ④	⑥	⑤ ⑥
T6	Width Coil(2. 8-22MH)	SA-366	RF800 ⑧	MWC-11

① Drill new mounting hole(s).
② Use 6 to 1 turns ratio.
③ Complete assembly.
④ Yoke unassembled.
⑤ Use original horizontal damping network with capacitor C97 a
⑥ Connect horizontal yoke terminal #3 to horizontal output trans
⑦ Use original horizontal yoke damping network.
⑧ Use terminals #1 and #2.
⑨ Use red and blue terminals.

*HORIZONTAL OUTPUT TRANS

Use Original Width Coil Unles

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacemen Connection
	8	9	9	9
	6	5	5	5
	3	3	3	3
	2	1	1	1
Connect Width Coil Across →	3 & 2	3 & 1	3 & 1	3 & 1

TRANSFORMER (AU

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ANDREA PART No.	Halldorson PART No.	Merit PART No.	Stan PART
T7	4.4KΩ	3-4Ω	ST-3061	Z1006	A3019	A3

SPEAK

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DA ANDREA PART No.	QUAM PART No.
SP1	12"	PM	3-4Ω	SL-4023 ①	12A31
SP2	4"	PM	3-4Ω	SL-4021 ①	4A07TZ3. 2
	4"	PM		SL-4022 ②	
	10"	PM		SL-4019 ③	10A31
	5"	PM		SL-4018 ④	5A07
	8"	PM		SL-4020 ⑤	8A21

COILS (R

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLA ANDREA PART No.	MEISS PART
L1	47. 25MC Trap	0Ω		SA-381	
L2	1st Video IF	. 1Ω	. 1Ω	SA-377A	
L3	2nd Video IF	. 1Ω	. 1Ω	SA-378	17-452
L4	3rd Video IF	. 1Ω	. 1Ω	SA-379	17-452
L5	4th Video IF	. 1Ω	. 1Ω	SA-380	17-500
L6	Series Peaking Coil	7. 5Ω		SA-349	
L7	Shunt Peaking Coil	13Ω		SA-350	19-330
L8	Series Peaking Coil	13Ω		SA-350	19-330
L9A	4. 5MC Trap	2Ω			
B	Sound IF	2Ω		SA-373	
L10	Series Peaking Coil	12Ω		SA-364	19-325
L11	Shunt Peaking Coil	13Ω		SA-350	19-330
L12	Ratio Det.	5. 5Ω	L 9ΩCT	SA-374	17-349

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	ANDREA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C59	500	3000	BCM-1616C2K	1467L2-HV-500	DD30-301	5P15T3		MCL350	30GA-T3	
C60	10000		HCC-1943	BPD-01	DD-103	K062	811-01	DC-511	5HK-S1	
C61	10000		HCC-1943	BPD-01	DD-103	K062	811-01	DC-511	5HK-S1	
C62	1000		HCC-1960	BPD-001	DD-102	K069	801-001	DC-531	5HK-D1	
C63	.005	600	HCC-1947	BPD-005	DE-502	CUB6D5	GP2-333-502	PT625	5TM-D5	
C64	.01	600	HCC-1006	BPD-01	DE-103	CUB6E1	GP3-333-103	PT631	5TM-E1	
C65	.01	600	HCC-1021	BPD-01	DE-103	CUB6E1	GP3-333-103	PT631	5TM-E1	
C66	.05	600	HCC-1023	BPD-05	DE-503	CUB6E5		PT635	5TM-E5	
C67	.01	1000	HCC-1009	PD6BN-01		CUB10E1		PT731	10TM-E1	
C68	250	500		SK250	DD-251	5W5T35	811-251	MC340	1FM-325	
C69	2000		HCC-1044	BPD-002	DD-202	K072	801-002	DC-533	5HK-D2	
C70	250	500	HCC-1034C	SK250	DE-251	2ER5T25	811-251	MC340	MB-325	
C71	.5	200	HCC-1033	PS8BN-5		CUB5P5		PT505	2TM-P5	
C72	.01	300	HCC-1009	BPD-01	DE-103	CUB6E1	GP3-333-103	PT631	5TM-E1	
C73A	2000									
B	5000		1FM-5389	1PA-110	1PC-100	1L5T5M1	11406-01		1V-1	
C	5000									
C74	.005	1000	HCC-1035							
C75	.01	600	HCC-1029							
C76	.02	600	HCC-1030	BPD-02	DE-203	CUB6E3	811-03	PT623	5TM-E3	
C77	.33	400	HCC-1018	P4BHN-25		CUB4P25		PT4025	4TM-P25	
C78	.003	1000	HCC-1021	HVD-15-3300	DD-302	CUB10D3		PT1023	10TM-D3	
C79	500	500	HCC-1035A			5R5T5	811-501	MC3245	MB-35	
C80	100	500	HCC-1001A	NP0-SU100	TCZ-100	2ER5T1	801-101	MC2241	MB-31	
C81	.002	600	HCC-1026	BPD-002	DE-302	CUB6D2	GP3-333-202	PT622	5TM-D2	
C82	.02	600	HCC-1030	BPD-02	DE-203	CUB6E3	811-03	PT623	5TM-E3	
C83	.5	300	HCC-1033	PS8BN-5		CUB5P5		PT505	2TM-P5	
C84	.05	400	HCC-1005	BPD-05	DE-503	CUB6E5		PT635	5TM-E5	
C85	10	500	HCC-1834A	HVD-SU10	TCZ-10	2ER5G5	831-100	MC3215	MB-41	
C86	250	500	HCC-1834C	1469-00SS	TCZ-250	2ER5T25	811-251	MC3240	MB-325	
C87	.01	600	HCC-1006	BPD-01	DE-103	CUB6E1	GP3-333-103	PT631	5TM-E1	
C88	.33	400	HCC-1018	P6BHN-25		CUB4P25		PT4025	4TM-P25	
C89	1500	500	HCC-1818A	BPD-0015	DD-152	IW5D15	811-153	MC256	1FM-315	
C90	500	500	HCC-1834A	SU500	DD-501	5W5T5	GP2K-501	MC245	MB-35	
C91	.1	600	HCC-1002	P6BHN-1	DF-104	CUB6P1		PT601	6TM-P1	
C92	.5	300	HCC-1033	P2BHN-5		CUB2P5		PT205	2TM-P5	
C93	.33	400	HCC-1018	P4BHN-5		CUB4P25		PT4025	4TM-P25	
C94	.02	600	HCC-1029							
C95	150	3000	HCC-1834A	HVD-30-150	DD30-151	5P25T15	3KV-151	MCL315	30GA-T15	
C96	150	3000	HCC-1834	HVD-30-150	DD30-151	5P25T15	3KV-151	MCL315	30GA-T15	
C97	75	3000	HCC-1835	1468L8-HV-75	DD30-75	5P25Q75			30GA-Q75	
C98	.05	400	HCC-1005	BPD-05	DF-503	CUB6E5		PT415	4TM-E5	
C99	.05	600	HCC-1003	BPD-05	DF-503	CUB6E5		PT415	4TM-E5	
C100	500	30000	HCE-2705A-1	UY-502		UY-507	413-204	MMU20T5	30QK-75	

† Items C73A, C73B, C73C, R76A, R76B and R76C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	ANDREA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	7500	½	GRV-846	F3-3	R7V-546	* QF-871	UF15R	Contrast (Panel)
B	5000Ω	½		R2-41			UR50A	Volume (Rear)
C	Switch			KS-1			US-28	Attach to R1B.
R2A	50KΩ	½	GRV-847	A4T-51	A47-50K-6	Q11-125	U-35	Horiz. Hold
B	Shaft		Not Req.	AK-4	KS6-3	Not Req.	Not Req.	Attach to R2A.
R3A	500Ω	½	GRV-847	A3-31	A47-50K-6	Q11-123	U-35	Brightness
B	Shaft		Not Req.	AK-4	KS6-3	Not Req.	Not Req.	Attach to R3A.
R4A	2Meg	½	GRV-844	AB-75	A47-2Meg-S	Q11-139	TA36L	Height
B	Shaft		Not Req.	AK-1	FK3-1/4	Not Req.	Not Req.	Attach to R4A.
R5A	1000Ω	2	GRV-849	VK-138	A43-1000	WP8-1000	R1000L	Vert. Linearity Wire Wound
B	Shaft		Not Req.	AK-4	FK3-1/4	Not Req.	Not Req.	Attach to R5A.
R6A	1.25Meg	½	GRV-846	AB-743	A47A-1Meg-S	Q11-138	U-165	Vert. Hold
B	Shaft		Not Req.	AK-4	KS6-3	Not Req.	Not Req.	Attach to R6A.

* Concentrikit Equivalent, K-4 Kit, Base Elements and Shafts; DiT-105 & P6-130 (Panel) B13-133 & R1-220 (Rear) 76-1 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ANDREA PART No.	IRC PART No.	NOTES
R7	560KΩ			BTS-560K	
R8	560K Ω			BTS-560K	
R9	560			BTS-560	
R10	100KΩ			BTS-100K	
R11	5Meg 5%			BTS-5Meg 5%	
R12	750KΩ 5%			BTS-750K 5%	
R13	470Ω			BTS-470	
R14	56KΩ			BTS-56K	
R15	56KΩ			BTS-56K	
R16	15KΩ				
R17	10KΩ			BTS-10K	
R18	6800Ω				
R19	56KΩ			BTS-56K	
R20	4700Ω	1		BTA-4700	
R21	100KΩ			BTS-100K	
R22	150KΩ			BTS-150K	
R23	1000Ω	1	GRC-321	BTA-1000	
R24	180KΩ		GRC-339	BTS-180K	
R25	3.3Meg			BTS-3.3Meg	Note 1
R26	3.3Meg			BTS-3.3Meg	Note 2
R27	47KΩ		GRC-207	BTS-47K	
R28	100KΩ		GRC-258	BTS-100K	
R29	10KΩ		GRC-304	BTS-10K	
R30	150KΩ		GRC-243	BTS-150K	
R31	47000Ω		GRC-207		
R32	1000Ω		GRC-210	BTS-1000	
R33	47Ω		GRC-211	BTS-47	
R34	1000Ω		GRC-210	BTS-1000	
R35	91000 5%		GRC-325		
R36	1000Ω		GRC-210	BTS-1000	
R37	47Ω		GRC-211	BTS-47	
R38	10KΩ		GRC-304		
R39	1000Ω		GRC-210	BTS-1000	
R40	1000Ω		GRC-332	BTS-1000	
R41	22Ω		GRC-218	BTS-22Ω	
R42	4700Ω		GRC-256	BTS-4700	
R43	10KΩ		GRC-304	BTS-10K	
R44	33KΩ		GRC-241	BTS-33K	
R45	10KΩ		GRC-304	BTS-10K	

ITEM No.	RATING OHMS	RATING WATT	ANDREA PART No.	IRC PART No.	NOTES
R46	4700Ω	2	GRC-256	BTS-4700	
R47	2200Ω		GRC-370	BTS-220K	
R48	22KΩ		GRC-201	BTS-22K	
R49	100KΩ		GRC-388	BTS-100K	
R50	22KΩ		GRC-201	BTS-22K	
R51	27KΩ		GRC-324	BTS-27K	
R52	150KΩ		GRC-243	BTS-150K	
R53	330Ω		GRC-210	BTS-1000	
R54	330Ω		GRC-339	BTS-330	
R55	330Ω		GRC-389	BTS-33	
R56	18KΩ		GRC-330	BTS-18K	
R57	47KΩ		GRC-207	BTS-47K	
R58	4.7Meg		GRC-207	BTS-4.7Meg	
R59	330KΩ		GRC-301	BTS-330K	
R60	470KΩ		GRC-229	BTS-470K	
R61	100KΩ		GRC-258	BTS-100K	
R62	330Ω	1	GRC-277	BTA-390	
R63	68KΩ			BTS-68K	
R64	22KΩ			BTS-22K	
R65	150KΩ	?	GRW-542	PWT-150Ω	
R66	47KΩ		GRC-207	BTS-47K	
R67	680KΩ		GRC-221	BTS-680K	
R68	10KΩ		GRC-304	BTS-10K	
R69	470KΩ		GRC-228	BTS-470K	
R70	2.2Meg		GRC-230	BTS-2.2Meg	
R71	150KΩ		GRC-243	BTS-150K	
R72	10KΩ	1	GRC-332	BTA-10K	
R73	680Ω	1	GRC-332	BTA-680Ω	
R74	10KΩ	1	GRC-232	BTA-10K	
R75	22KΩ		GRC-201	BTS-22K	
R76A	22KΩ			BTS-22K	
B	8300Ω			† FM-5289 (	BTS-8200
C	5000Ω				BTS-5000
R77	1Meg		GRC-311	BTS-1Meg	
L10	Series Peaking Coil	13Ω	BA-364	19-3350	TV-185	6130	370 Microhenries
L11	Shunt Peaking Coil	13Ω	BA-364	19-3300	TV-190	6133	330 Microhenries
L12	Ratio Det.	5.8Ω	L-90CT	BA-376	17-3497	TV-115	6205	Tertiary Windings, 5Ω

TV PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	ANDREA PART No.	IRC PART No.	NOTES
R83	680Ω	2	GRC-354	BTS-680	
R84	68KΩ		GRC-204	BTS-68K	
R85	56Ω		GRC-250		
R86	56KΩ		GRC-250		
R87	100KΩ		GRC-258		
R88	150KΩ		GRC-243		
R89	3.3Meg		GRC-308		
R90	820KΩ		GRC-246		
R91	10KΩ		GRC-304		
R92	150KΩ		GRC-243		
R93	150KΩ		GRC-243		
R94	150KΩ		GRC-243		
R95	2200Ω		GRC-385		
R96	27KΩ		GRC-324		

Note 1. Some versions use a 4.7Meg ½W resistor in this application.
Note 2. Not used in some versions.
Note 3. Used in 50 cycle models only.
† Items R76A, R76B, R76C, C73A, C73B, C73C are combined in one unit.

ITEM No.	RATING OHMS	RATING WATT	ANDREA PART No.	IRC PART No.	NOTES
R97	150KΩ		GRC-243		
R98	22KΩ		GRC-201		
R99	47KΩ		GRC-207		
R100	470KΩ		GRC-207		
R101	470KΩ		GRC-228		
R102	8200Ω	2	GRC-298		
R103	100Ω	2	GRC-335		
R104	2250	10		1 2/4A-225	
R105	22KΩ		GRC-201	BTS-22K	
R106	470Ω		GRC-205		
R107	470KΩ	1	GRC-390	BTA-470K	
R108	2500Ω	15	GRW-545	2D-2500	
R109	2200Ω	2		BTB-2200	Note 3

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	ANDREA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	540VCT	5V	6.3V	ST-3053					
		@ 1.8A	@ 2.40A	@ 3A @ 1.5A	ST-3069 ①					

① For 50 cycle operation.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	ANDREA PART No	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L13	21Ω	53Ω	BA-335	20-1402*	TV-163 *	6183 *	205B1 *	R-100 *	HB-5	Waveform winding (4Ω)

* Reverse coil mounting in can.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	ANDREA PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	ST-3068	B6701	A-4003	208T9	V402	A-8122	26A04	A-97T
T3	Horiz. Output Trans.	ST-3063	F3619 * ①	HVO-16 *	239T1 * ①	2094 * ①	A-8244 *	FLY-18 * ①	D-80 * ①
T4	Vert. Output Trans.	ST-3054	Q1900 ②	A-3823		V314 ①	A-8147 ①	26S71	A-108X
T5A	Yoke(90°)Horiz.(HMH)	S-144 ③	DF607 ③	MDF-02	21SD1 ③	Y90P19/43	DY-33A ③	Y-16 ③	Y-41-1 ③
B	Vert.(40MH)	ST-3058A ③							
T6	Width Coil(3.8-12MH)	BA-366	RF800 ③	MWC-11	21ER1 ③	20IR18 ③	WC-3 ③	WC-16	WC-12

① Drill new mounting hole(s).
② Use 8 to 1 turns ratio.
③ Complete assembly.
④ Yoke unassembled.
⑤ Use original horizontal damping network with capacitor C87 across terminals #3 and #7.
⑥ Connect horizontal yoke terminal #3 to horizontal output transformer terminal #6, horizontal yoke terminal #1 to capacitor C94.
⑦ Use original horizontal yoke damping network.
⑧ Use terminals #1 and #2.
⑨ Use red and blue terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	9	9	9	9	5	9	9
	6	5	5	5	5	3	5	5
	3	3	3	3	3	2	3	3
	1	1	1	1	1	1	1	1
Connect Width Coil Across ⟶	3 & 2	3 & 1	3 & 1	3 & 1	3 & 1	2 & 1	3 & 1	3 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	ANDREA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T7	4.4KΩ	3.4Ω	ST-3061	Z1008	A3018	A3833	26S49	S-5Z	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	ANDREA PART No.	CHAM PART No.	RCA TYPE No.	NOTES
SP1	12"	PM	3-4Ω	SL-4023 ①	12A31	12S31	① Used in Model CQ-VP21.
SP2	4"	PM	3-4Ω	SL-4031 ①	4A07T22.2		① Used in Model LB-VP21.
	4"	PM		SL-4023 ②			② Used in Models C-VP21 and LB-VP21
	10"	PM		SL-4018 ③	10A31	23S51	③ Used in Model T-VP21.
	5"	PM		SL-4018 ④	5A07	20S52	④ Used in Model MC-VP21.
	8"	PM		SL-4020 ⑤	8A21	20S82	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	ANDREA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	47.5MC Trap	0Ω		SA-381				
L3	1st Video IF	.1Ω	.1Ω	SA-377A				
L5	2nd Video IF	.1Ω	.1Ω	SA-378	17-4522	TV-130	6210	
L4	3rd Video IF	.1Ω	.1Ω	SA-379	17-4523	TV-130	6210	
L5	4th Video IF	.1Ω	.1Ω	SA-380	17-5004	TV-125	6234	
L6	Series Peaking Coil	7.5Ω		SA-349			4563	54 Microhenries
L7	Shunt Peaking Coil	13Ω		SA-350	19-3300	TV-190	6133	330 Microhenries
L8	Series Peaking Coil	13Ω		SA-350	19-3300	TV-190	6133	330 Microhenries
L9A	4.5MC Trap	2Ω		SA-373				
B	Sound IF	2Ω						
L10	Series Peaking Coil	13Ω		SA-364	19-3350	TV-185	6130	370 Microhenries
L11	Shunt Peaking Coil	13Ω		SA-364	19-3300	TV-190	6133	330 Microhenries
L12	Ratio Det.	5.8Ω	L-90CT	BA-376	17-3497	TV-115	6205	Tertiary Windings, 5Ω

FILTER CHOKE

ITEM No	RATINGS TOTAL DIRECT CURRENT	RATINGS D C RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~	ANDREA PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
L14	.240A	64Ω	L 98HY	ST-3065	C5037 L	C2996 L	C2326 L	26C44	C-17X L

L Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	ANDREA PART No FUSE	ANDREA PART No HOLDER	LITTELFUSE PART No FUSE	LITTELFUSE PART No HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
M1	3AG	1/4A			313.250		GJV 1/4	
	P/T	250V			(3AG P/T 1/4 A)			

MISCELLANEOUS

ITEM No.	PART NAME	ANDREA PART No.	NOTES
M2	Dial Light		#47
M3	Tuner		VHF-All Models
	Tuner	FM-5344V	UHF-(VHF-UHF Models Only)
M5	Switch	FM-5356	Radio-TV-Phono (Rotary, Wafer Type) Used in Model C5-VP21 Only.
M6	Centering Device	ST-3067	
M7	Ion Trap	FM-5315	
B3	Trimmer Cap.	HCV-3123	Horiz. Lock-in
B4	Trimmer Cap.		Horiz. Drive
	Knob	FM-5351	Channel Selector-VHF Models
	Knob	FM-5349	Fine Tuning-VHF Models
	Knob	FM-5353	Contrast
	Knob	FM-5357	Radio-TV-Phono Switch-Model C5-VP21 Only
	Knob	FM-5348	On-Off-Volume
	Knob	FM-5339	Vertical Hold-Model C5-VP21 Only
	Knob	FM-5350	Horiz. Hold, brightness & vert. hold - All models except C5-VP21
	Knob	FM-5333	VHF Fine Tuning-(UHF-VHF Models)
	Knob	FM-5336	Channel Selector With UHF Prism-(UHF-VHF Models)
	Knob	FM-5334	UHF Tuning (UHF-VHF Models)
	Dial	FM-5325	UHF (UHF-VHF Models)

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V19	FM RF Amplifier	12BA6	
V20	FM-AM Mixer-Oscillator	12AT7	
V21	FM-AM IF Amplifier	12BA6	
V22	2nd. FM IF Amplifier	12AU6	
V23	Ratio Detector	12AL5	
V24	AM Det.-AVC-AF Amplifier	12AV6	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	ANDREA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C101A	40	200			BO24	FP231	ITM-D40-250	T-090	R2234 †	
B	40	200			BR20205	TC55	ITP-D0-250	MT-3320		
C	20	200								
C102	5	25		5RL25V5	BR550	TC30	TD-5-25	MMT-0505	TVA-1203	
C103	10	100		PR8150V10	BR1015	TC42	TD-10-150	FM-1512	TVA-1406	

† Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	JUNEBRA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C104	2000			BPD-002	DD-202	K072	801-002	DC-533	5HK-D2	
C105	220			DD-00022	DD-221	G051	811-221	DC-5322	5GA-T22	
C106	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C107	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C108	100			N750-DD100	TCN-100	N043	N750L-101	NT-531	5TCU-T1	
C109	220			DD-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C110	100			N750-DD100	TCN-100	N043	N750L-101	NT-531	5TCU-T1	
C111	47			N750-DD47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C112	53									
C113	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C114	47			N750-DD47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C115	5000			BPD-008	DD-502	K080	811-005	DC-526	5HK-D5	
C116	10000			BPD-01	DD-103	K062	811-01	DC-511	5HK-S1	
C117	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C118	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C119	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C120	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C121	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C122	220			DD-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C123	500			BD500	DD-501	T947	GP2K-501	DC-533	5GA-T5	
C124	.05	200		BPD-05	DF-503	CUB6E5		PT635	5TM-E5	
C125				N750-DD100	TCN-100	N042	N750L-101	NT-531	5TCU-T1	
C126	100			N750-DD100	TCN-100	N043	N750L-101	NT-531	5TCU-T1	
C127	.005	400		BPD-005	DE-502	CUB6D5	GP2-333-502	PT625	5TM-D5	
C128	.01	400		BPD-01	DE-103	CUB6E1	GP3-333-103	PT631	5TM-E1	
C129	100			N750-DD100	TCN-100	N043	N750L-101	NT-531	5TCU-T1	Note 3
C130	.002	400		BPD-002	DE-302	CUB6D2	GP3-333-202	PT622	5TM-D2	
C131	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C132				BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C133	.05	400		BPD-05	DF-503	CUB6E5		PT415	4TM-E5	
C134	.05	400		BPD-05	DF-503	CUB6E5		PT415	4TM-E5	
C135	.05	400		BPD-05	DF-503	CUB6E5		PT415	4TM-E5	

Note 3. Some versions may use a 330MMF unit in this application.

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ANDREA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R110A	500KΩ	½	V305-2	F1-41		♦ QJ-1003	UF55A	Tone (Panel)
B	500KΩ	½		R2-41			UR55A	Volume (Rear)
C	Switch			KB-1			US-26	Attach to R110B

♦ Concentrikit Equivalent, K-2 Kit, Base Elements and Shafts; B13-133 & P1-200 (Panel)
B13-133 & R1-216 (Rear)
76-1 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ANDREA PART No.	IRC PART No.	
R111	220Ω			BTS-220	
R112	68Ω			BTS-68	
R113	10Ω			BTS-10	
R114	22KΩ			BTS-22K	
R115	2.2Meg			BTS-2.2Meg	
R116	220Ω			BTS-220	
R117	470KΩ			BTS-470K	
R118	220Ω			BTS-220	
R119	2.2Meg			BTS-2.2Meg	
R120	22KΩ			BTS-22K	
R121	68Ω			BTS-68	
R122	39Ω			BTS-39	
R123	220Ω			BTS-220	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ANDREA PART No.	IRC PART No.	
R124	100Ω			BTS-100	
R125	47Ω			BTS-47	
R126	33KΩ			BTS-33K	
R127	22KΩ			BTS-22K	
R128	220KΩ			BTS-220K	
R129	6.8Meg			BTS-6.8Meg	
R130	10Meg			BTS-10Meg	
R131	470KΩ	1		BTA-470K	
R132	150Ω			BTS-150	
R133	100Ω	2		BTB-100	
R134	12Ω	1		BW1-12	Note 4
R135	250Ω	10	GRW-522	PW10-250	
R136	470Ω			BTS-470	

Note 4. Some versions use a 22Ω 1W (WW) resistor in this application.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ANDREA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L15	FM Ant. Coil	0Ω	0Ω					
L16	RF Choke	.3Ω						5.1 Microhenries
L17	FM RF Coil	0Ω						Tapped
L18	FM Osc. Coil	0Ω						Tapped
L19	AM Loop Ant.	1.9Ω						
L20	Cathode Choke	0Ω						.8 Microhenries
L21	Fil. Choke	.4Ω						8.8 Microhenries
L22	Fil. Choke	.4Ω						8.8 Microhenries
L23	AM Osc. Coil	5.8Ω						Tapped ③ .9Ω
L24	1st FM IF	.8Ω	.8Ω	1106B-1	16-3487	FM-254	1463	
L25	1st AM IF	28Ω *	19Ω	1091C-2				
L26	2nd FM IF	.8Ω	.8Ω	1106B-1	16-3487	FM-254	1463	
L27	2nd AM IF	16Ω	16Ω	1-110	16-6758	BC-353	12-C2	
L28	Ratio Det.	1.8Ω	.9ΩCT	1106B-2	17-3498	FM-255	1465	Tertiary Winding=.5Ω

* Tapped ③ 20Ω.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ANDREA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L29	.045A	145Ω	4.3HY	1C42-G1	C5007	C-2977 ①	C-1706	26C82 ①	C-13X ②

① Drill one new mounting hole.
② Holes are drilled for 3 1/8 mounting.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	ANDREA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M8	.045A		1263A	RS065Q	6S65	8J1	65	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	ANDREA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M9	S-25	40-T	A-1 and A-3	46-T	0-1 or S-1 and 0-3	

ASTATIC AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

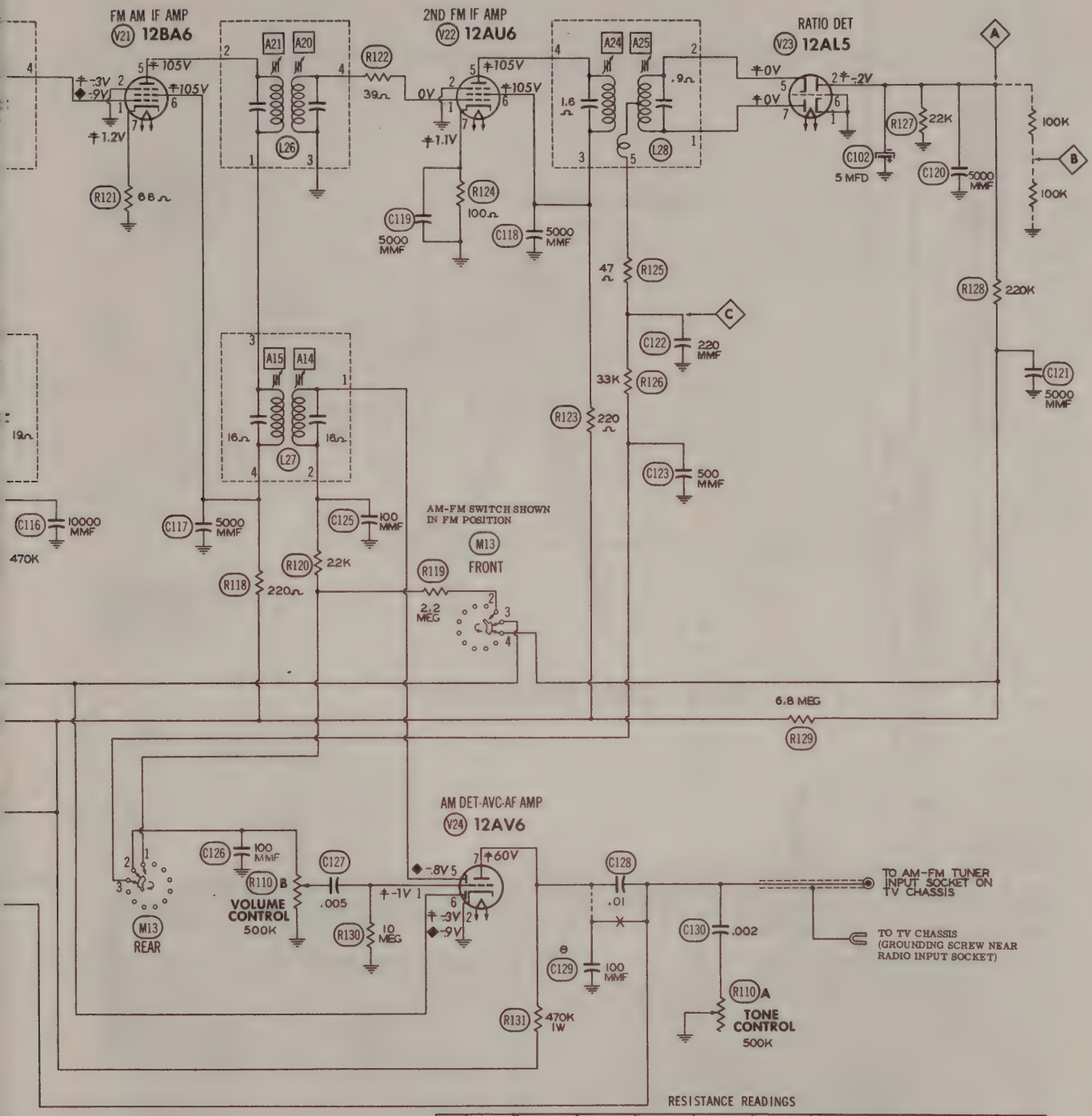
PHONO NEEDLE

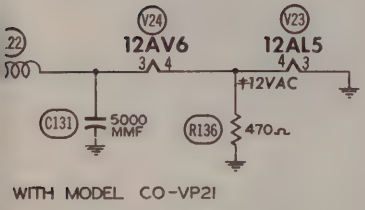
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	ANDREA PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M10	S-26 (78RPM Needle)	* A-85 or † A-75 or ♦ A-75D	* C-309 or † C-348 or ♦ C-348D	* W-5A or † W-5S or ♦ W-5D	* Metal † Jewel ♦ Diamond
	S-27 (33 1/3-45RPM Needle)	* A-85LP or † A-75LP or ♦ A-75LPD	* A-319 or † A-347 or ♦ A-347D	* W-5MGA or † W-5MGS or ♦ W-5MGD	

MISCELLANEOUS

ITEM No.	PART NAME	ANDREA PART No.	NOTES
M11	Dial Light		7W (115-125V)-Model C0-VP21 Only
M12	Tuning Cap.	2052E3	4 Gang, AM Section of Tuning Cap. (15-515MMF, 26-200MMF) Model C0-VP21 Only
M13	Switch		AM-FM (6 Pole-2 Position, Rotary, Wafer Type) Model C0-VP21
	Knob	FM-5358-1	On-Off-Volume-Model C0-VP21 Only
	Knob	FM-5358-2	AM-FM Switch-Model C0-VP21 Only
	Knob	FM-5358-3	Tone-Model C0-VP21 Only
	Knob	FM-5358-4	Tuning-Model C0-VP21 Only



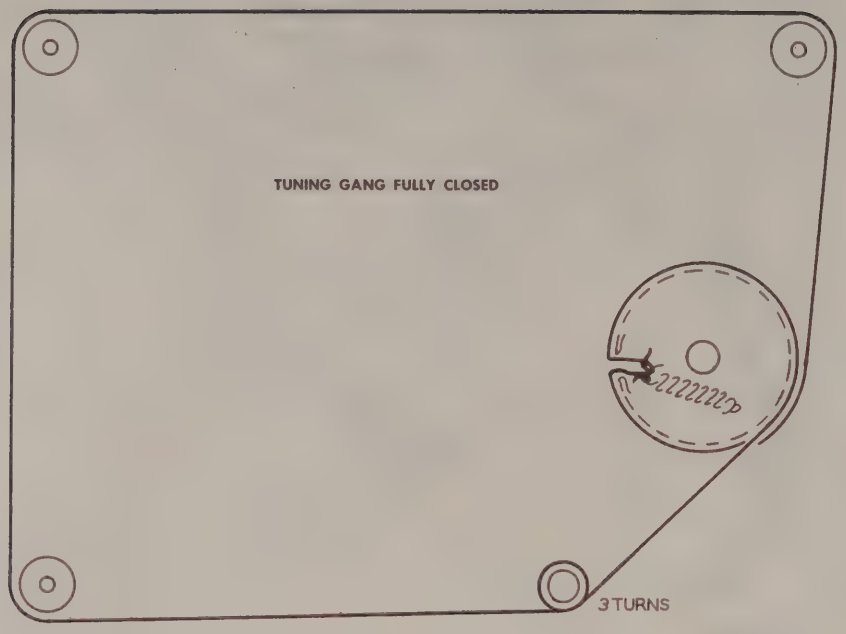


WITH MODEL CO-VP21

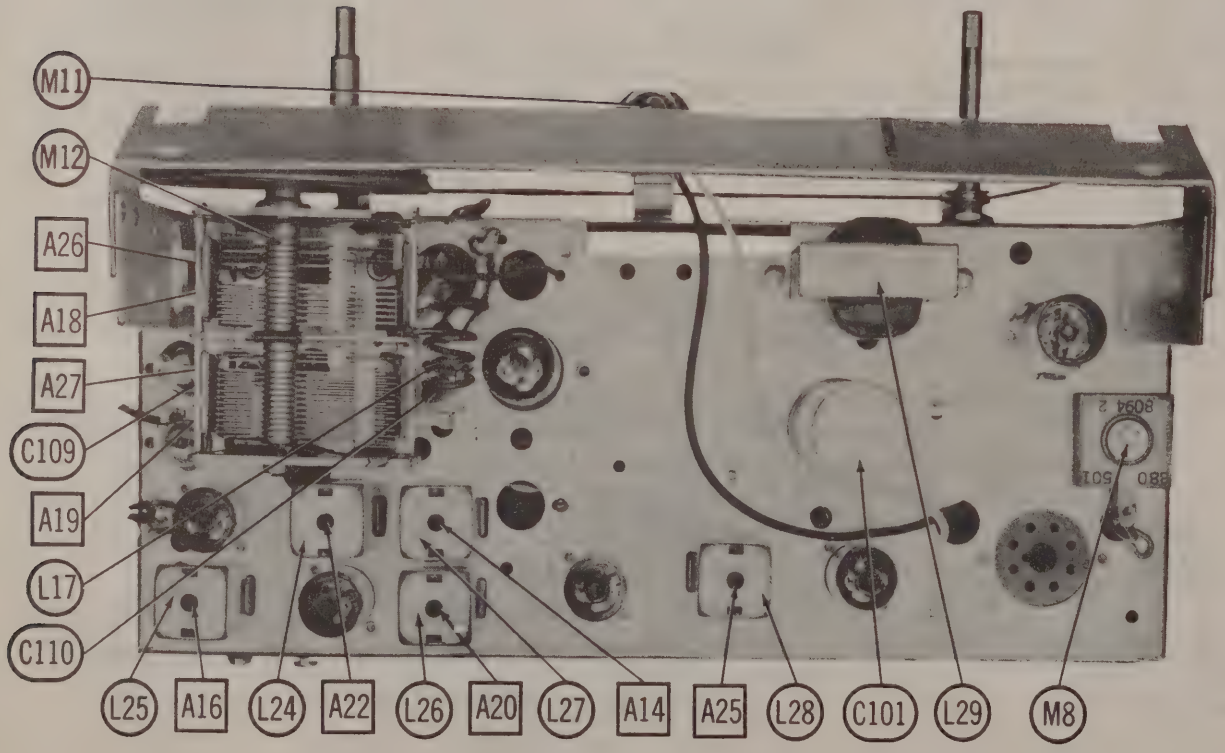
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V19	12BA6	ǂ 200KΩ	0Ω	32Ω	42Ω	♦ 460Ω	♦ 450Ω	68Ω		
V20	12AT7	♦ 240Ω	22KΩ	ǂ 0Ω • .9Ω	32Ω	22Ω	♦ 460Ω	2.2Meg	ǂ 0Ω • .9Ω	27Ω
V21	12BA6	ǂ 600KΩ • 3Meg	0Ω	50Ω	42Ω	♦ 460Ω	♦ 460Ω	68Ω		
V22	12AU6	39Ω	0Ω	50Ω	60Ω	♦ 460Ω	♦ 460Ω	100Ω		
V23	12AL5	0Ω	22KΩ	0Ω	11Ω	400KΩ	0Ω	400KΩ		
V24	12AV6	10Meg	0Ω	22Ω	11Ω	400KΩ	ǂ 200KΩ • 2.5Meg	♦ 470KΩ		

ǂ MEASURED WITH SELECTOR SWITCH (M5) IN RADIO POSITION, AND AM-FM SWITCH (M13) IN FM POSITION.
♦ MEASURED WITH AM-FM SWITCH (M13) IN AM POSITION.
MEASURED FROM OUTPUT OF M8.



DIAL CORD STRINGING



RADIO CHASSIS TOP VIEW

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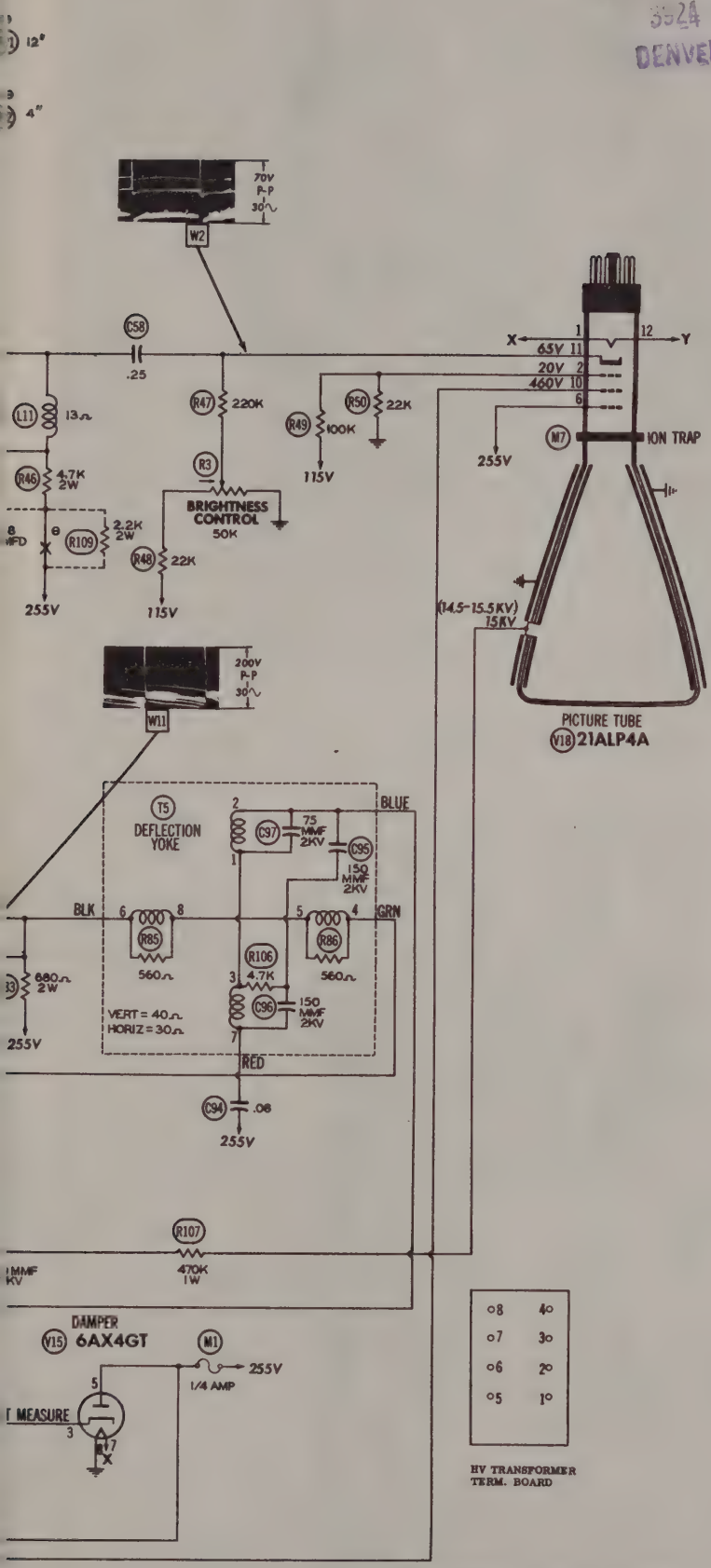
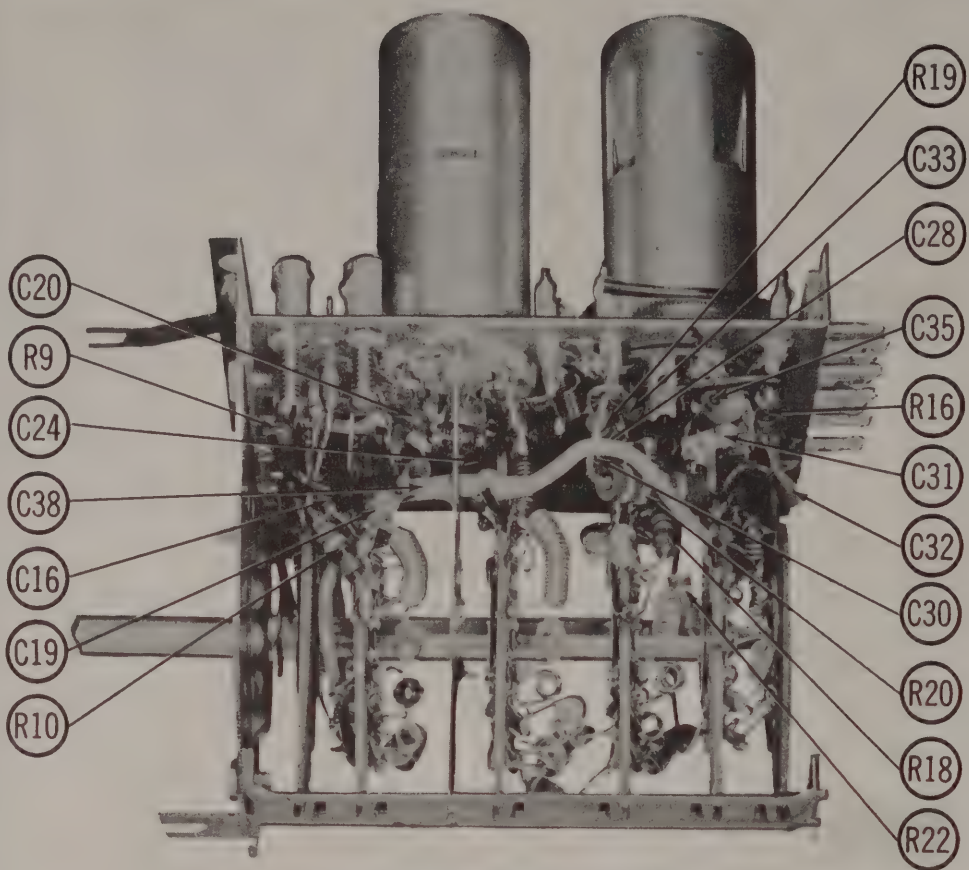
3524 MEADE ST.
DENVER, COLORADO

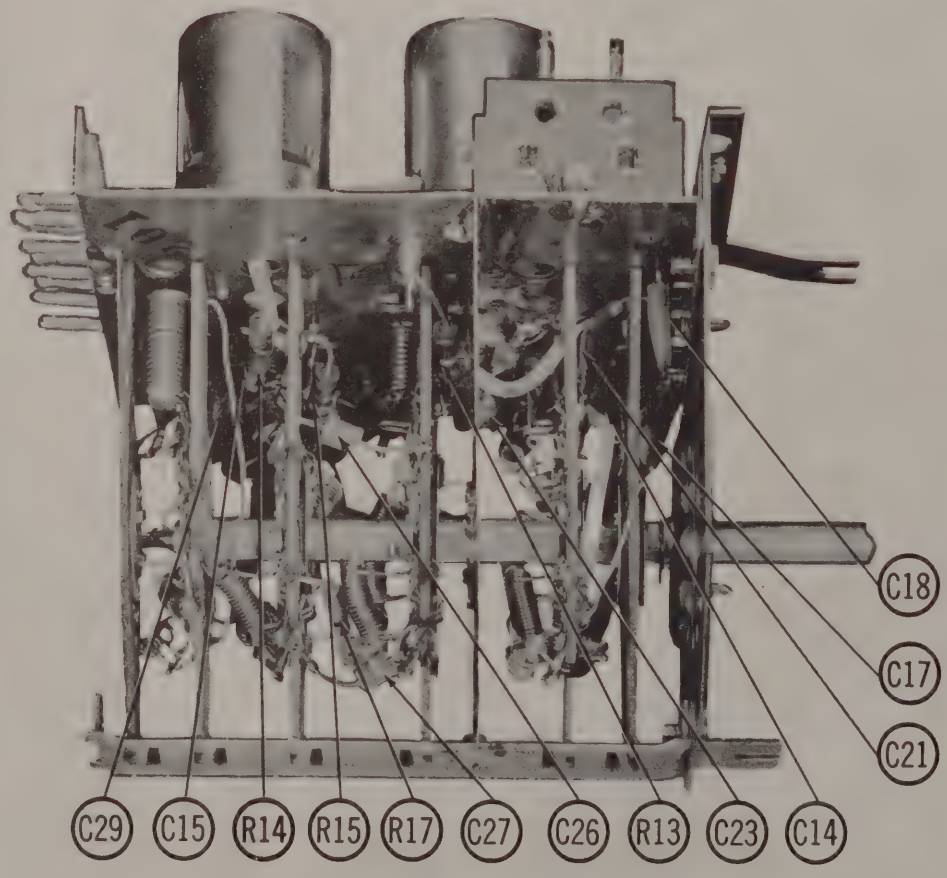


ANDREA MODELS C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21 (Ch. VP21)

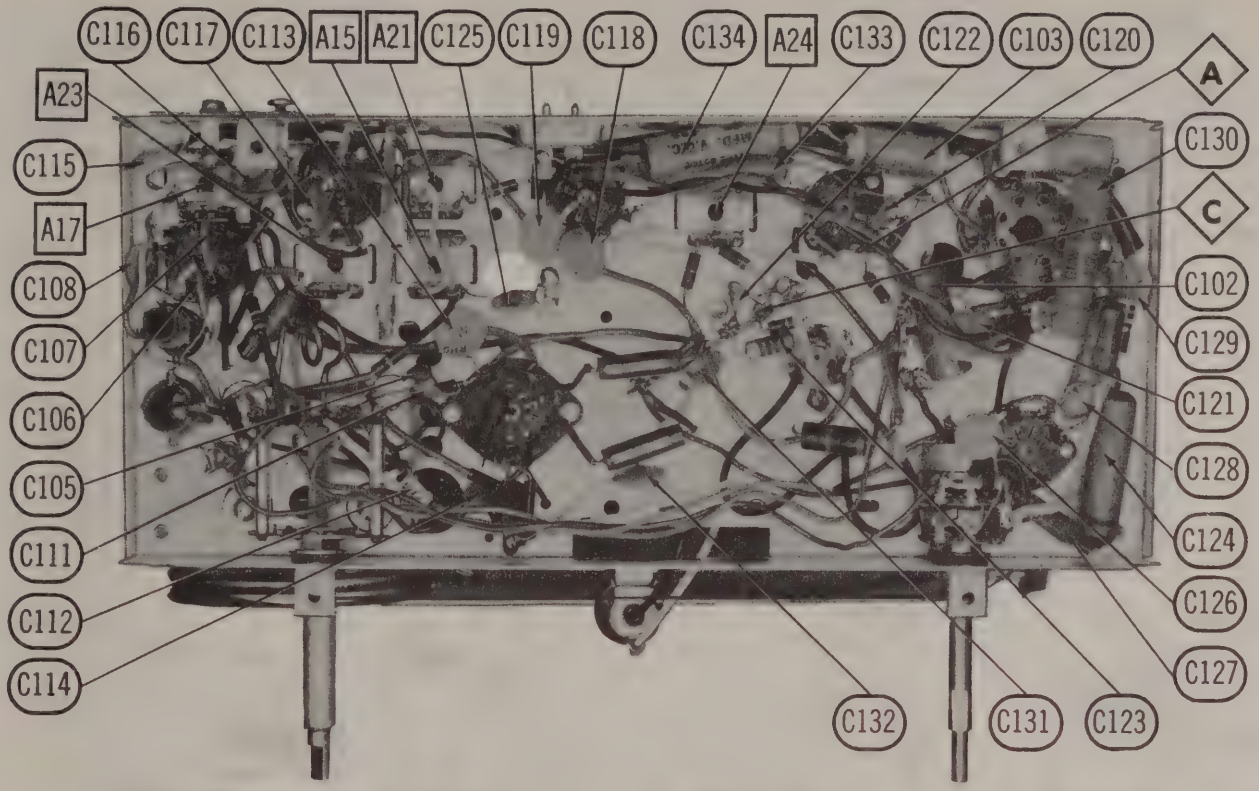
ANDREA MODELS C-VP21, CO-VP21, LB-VP21, MC-VP21, T-VP21 (Ch. VP21)



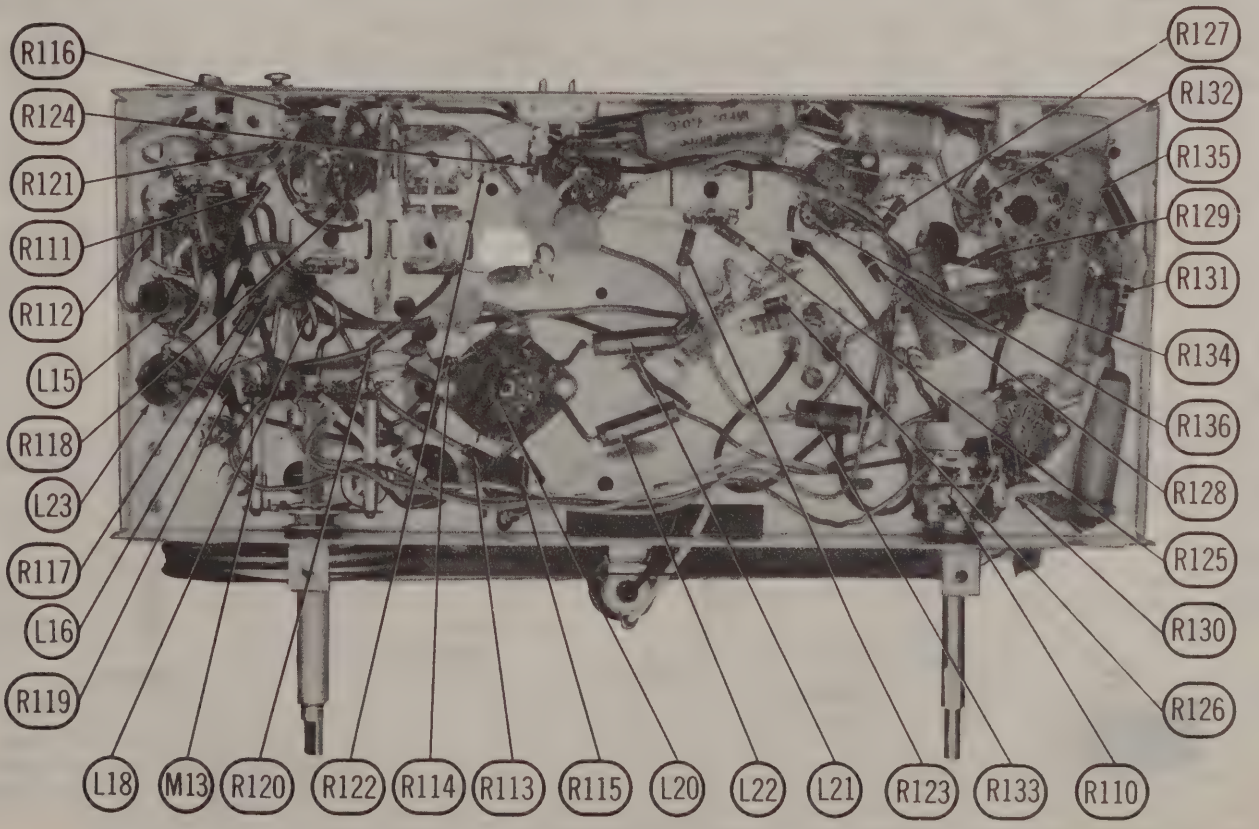
RF TUNER-RIGHT SIDE



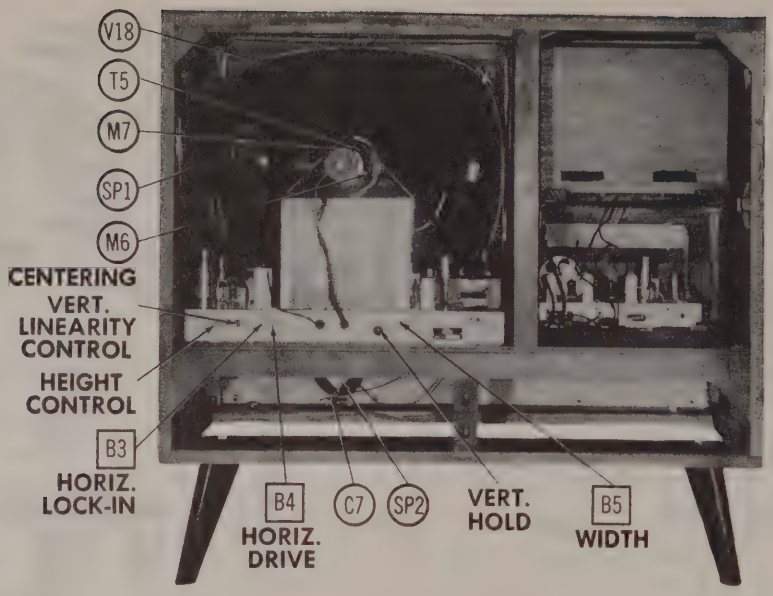
RF TUNER-LEFT SIDE



RADIO CHASSIS BOTTOM VIEW-CAPACITOR & ALIGN. IDENT.



RADIO CHASSIS BOTTOM VIEW RESISTOR & INDUCTOR IDENT.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set the horizontal lock-in trimmer (B3) to 1/4 turn from full clockwise position. Set the horizontal drive trimmer (B4) to 1/4 turn from full clockwise position.

Set the horizontal frequency slug (B1) so that one inch of the screw protrudes from the can.

Set the horizontal waveform slug (B2) 3 turns from full counter clockwise position.

Connect the low capacity probe of the oscilloscope to terminal "C" of the horizontal oscillator transformer (L13). Connect the low side of the oscilloscope to the chassis.

Turn the brightness and the horizontal hold controls fully clockwise. Adjust B1 until the picture holds sync.

Adjust B2 so that the broad and narrow peaks of the waveform on the scope are equal in height as in Fig. 6.

Adjust the brightness control until picture just becomes visible. Check the horizontal range. If it is less than 120 degrees adjust B2 until it is at least 120 degrees.

Turn the brightness and the horizontal hold controls fully clockwise and if necessary, adjust B1 until the picture is just in sync.

Adjust the horizontal drive trimmer (B4) counter clockwise as far as possible without the presence of white vertical lines or compression near the center of the picture. Adjust the width control (B5) for a picture slightly wider than necessary to fill the picture mask horizontally.

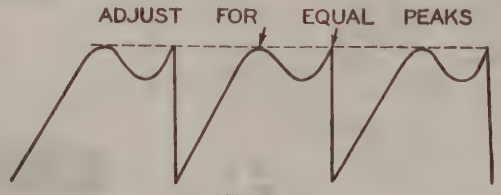
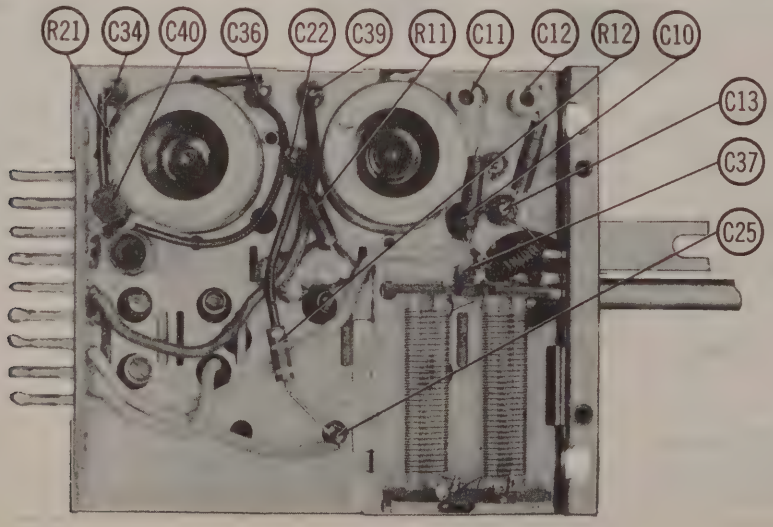


FIG. 6



RF TUNER TOP VIEW

RETMA MEMBER

CORONADO
MODEL RA33-8115A

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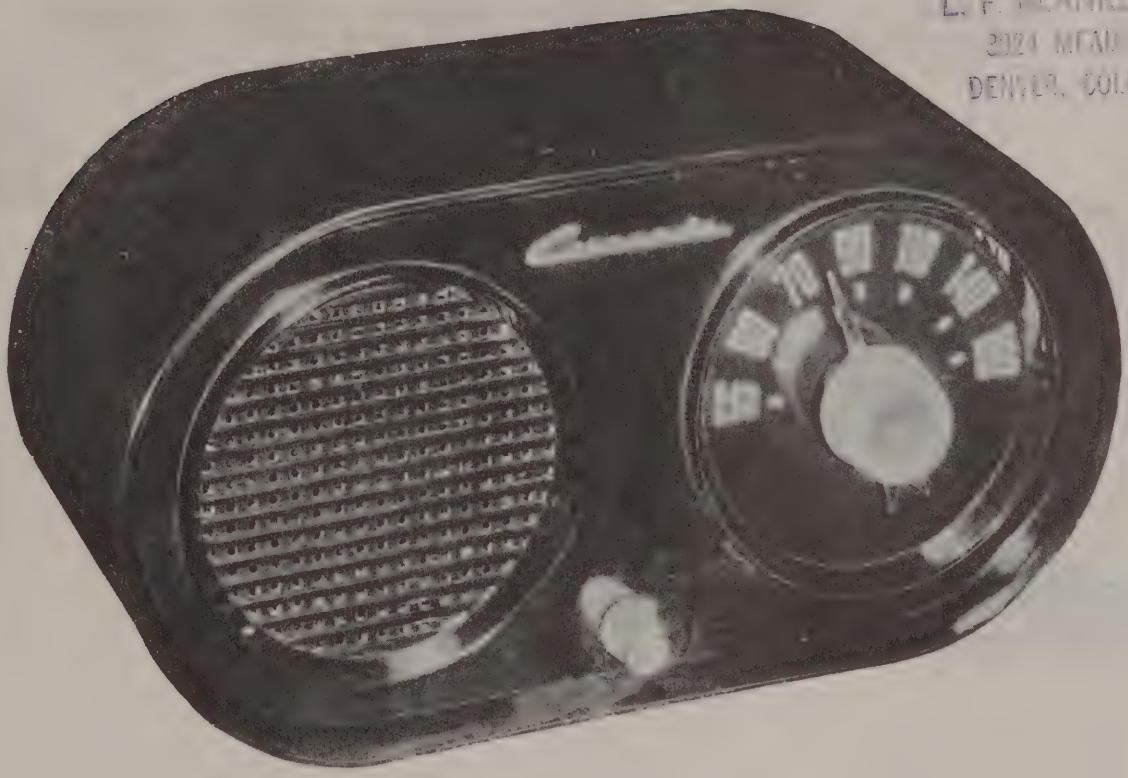
DENVER, COLORADO

CORONADO
MODEL RA33-8115A



CORONADO
MODEL RA33-8115A

TRADE NAME	Coronado Model RA33-8115A
SUPPLIER	Gamble-Skogmo Inc., 15 N. 8th St., Minneapolis, Minn.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Four)	Types 12AU6 Converter, 12AV6 Det. -AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.22 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to stator lug of antenna section. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1640KC	"	"	A3	"
3.	"	Loop	1400KC	Tune to 1400KC signal	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

CORONADO
Model RA33-8115A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	Det.-AF Amp.	12AV6	
V3	Output	50C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 40	150	C-40-20-20	AFH3-72	XC007	FP306	TMT57	T-260	TVL-3422
B	▲ 20	150							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	47		C0505C	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C3A	220		34C3	PA-100-1	D6-221	TP39	GP2K-221	UC-5322	34C3	
B	2000				DD-202	K072	801-002	DC-522		
C	220				D6-221	TP39	GP2K-221	UC-5322		
D	5000				DD-502	K080	811-005	DC-525		
C4	5000		C0055D	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C5	.05	400	C054	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C6	.05	400	C054	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	VRT-64	AB-70	A47-1Meg-Z	Q13-137	U-53	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A.

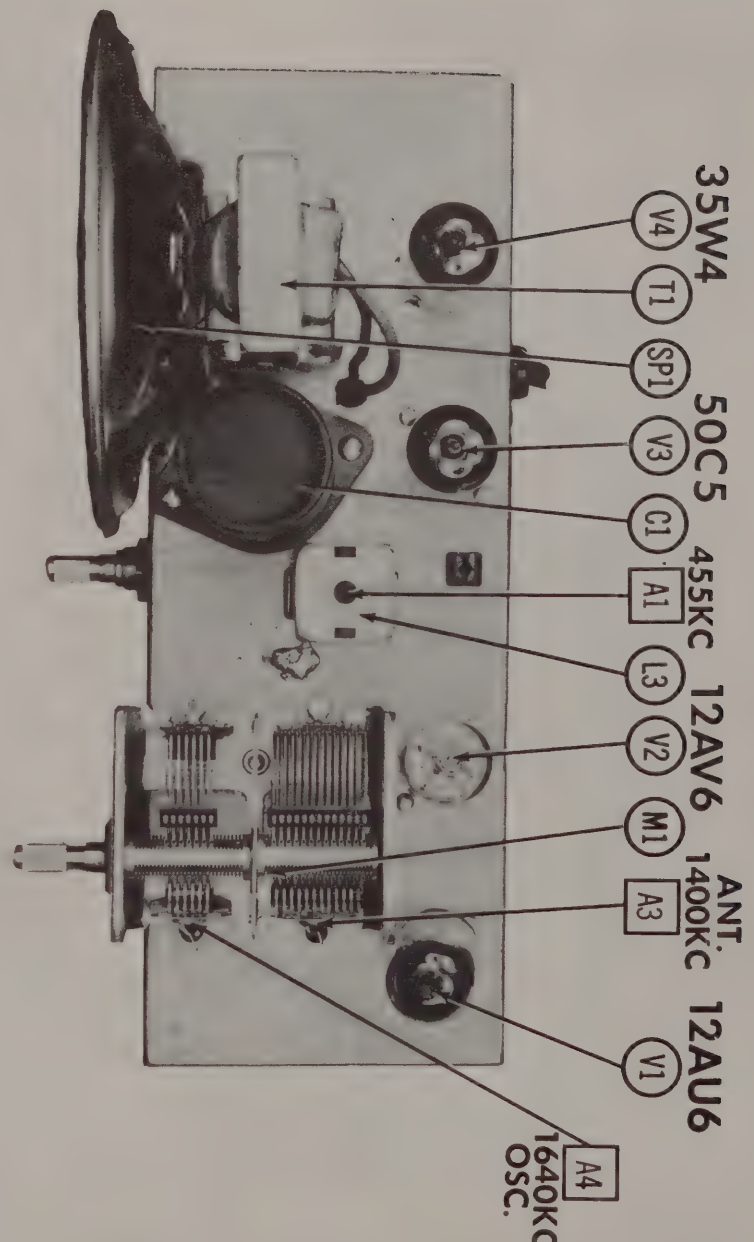
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CORONADO PART No.	IRC PART No.	
R2	2.2Meg		R225.5	BTS-2.2Meg	
R3	10Meg		R106.5	BTS-10Meg	
R4	470KΩ		R474.5	BTS-470K	
R5	470KΩ		R474.5	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CORONADO PART No.	IRC PART No.	
R6	150Ω		R151.5	BTS-150	
R7	2200Ω		R222.5	BTS-2200	
R8	68Ω	2	R680.2	BTB-68	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.65KΩ	3-4Ω	Part of Speaker SPK-86	Z1101 ①	A-3025 ①	A-3332 ①	26S58 ①	S-12X ①	① Bend ears down to fit.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	SPK-86	4A07R		

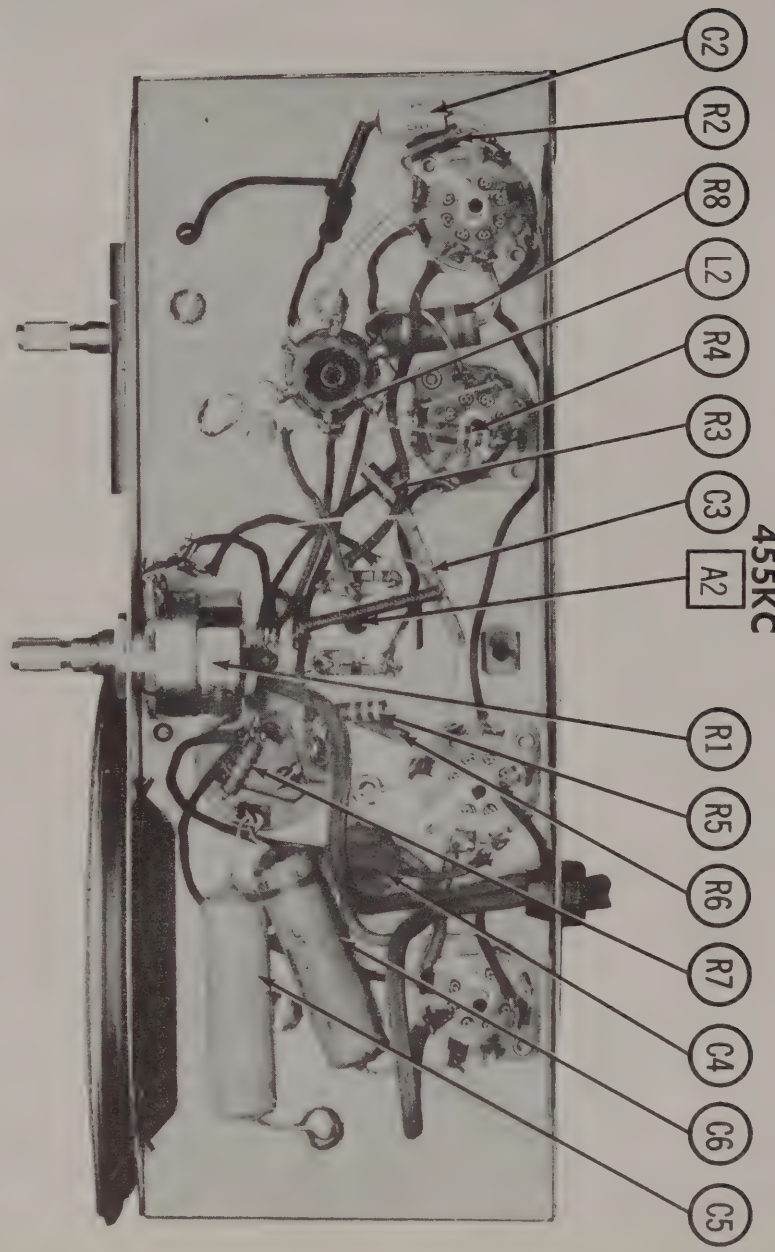
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.5Ω		LT86				
L2	Osc. Coil	1Ω	7.3Ω	L0T86				Tertiary Winding=2.3Ω
L3	IF Trans.	28Ω *	28Ω	L1FT86				* Tap ③ 1Ω

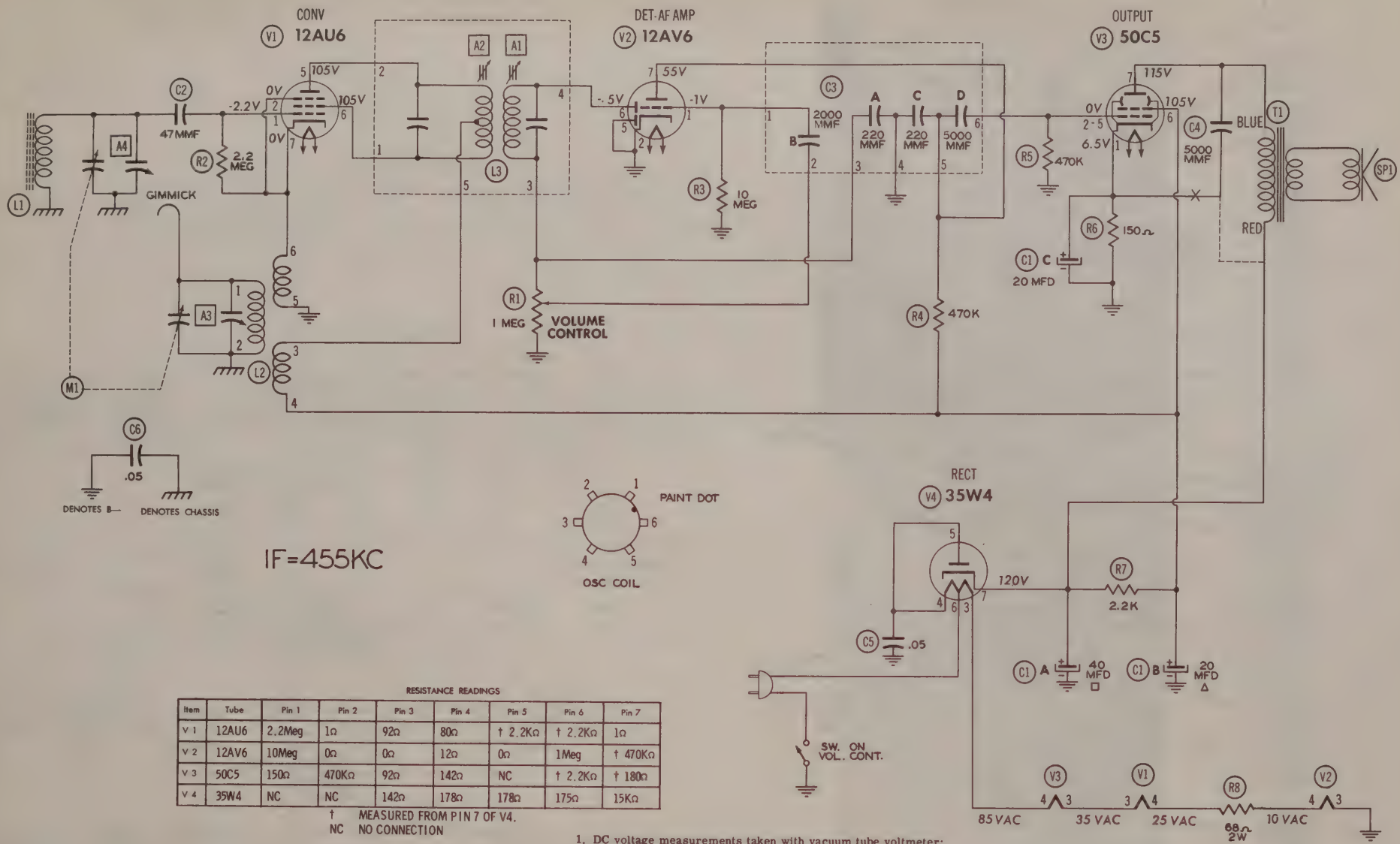
MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M1	Tuning Cap.	VCT86	2 Gang (45-455MMF, 16-130MMF)
	Cabinet	P-1701W	
	Knob	15B313	Tuning & Pointer
	Knob	P-1704WH	On-Off-Volume

CHASSIS—BOTTOM VIEW



CORONADO
Model RA33-811SA



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	2.2Meg	1Ω	92Ω	80Ω	† 2.2KΩ	† 2.2KΩ	1Ω
V 2	12AV6	10Meg	0Ω	0Ω	12Ω	0Ω	1Meg	† 470KΩ
V 3	50C5	150Ω	470KΩ	92Ω	142Ω	NC	† 2.2KΩ	† 180Ω
V 4	35W4	NC	NC	142Ω	178Ω	178Ω	175Ω	15KΩ

† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PHOTOFACT* Folder

*TRADE MARK

CORONADO MODELS TV1-9320A, TV1-9330A, TV1-9332A

PROPERTY OF
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DENVER, COLORADO

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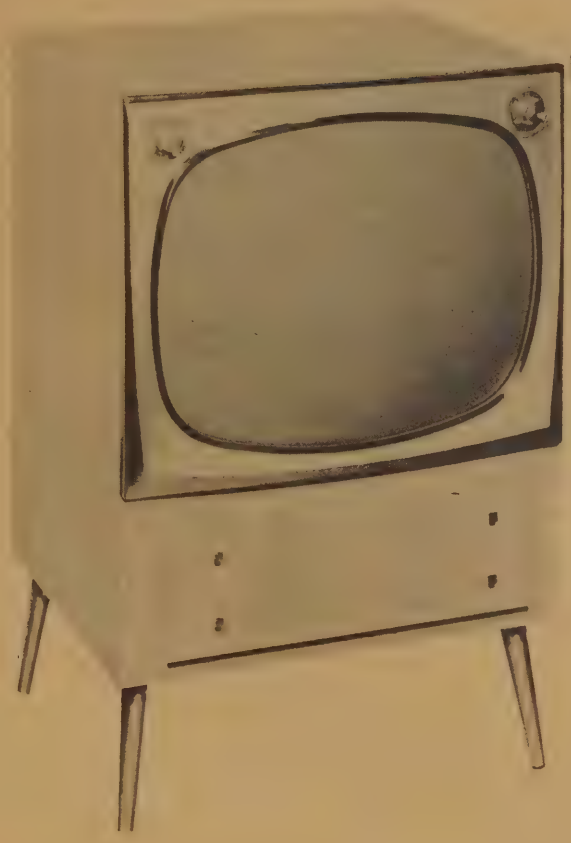

CORONADO MODEL TV1-9332A

TRADE NAME	Coronado Models TV1-9320A, TV1-9330A, TV1-9332A
SUPPLIER	Gamble-Skogmo Inc., 15 N. 8th St., Minneapolis, Minn.
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	105-115 Volts AC-60 Cycle RATING 1.6 @ 115 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.75MC, Sound IF 22.25MC (Intercarrier)

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CORONADO MODELS TV1-9320A, TV1-9330A, TV1-9332A

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DATE 8-56 SET 326 FOLDER 6

PHOTOFACT* Folder
*TRADE MARK

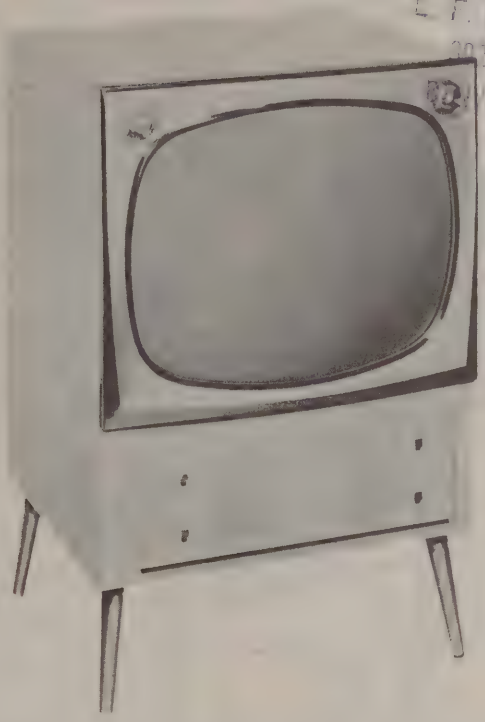
CORONADO MODELS TV1-9320A, TV1-9330A, TV1-9332A

PROPERTY OF
L. F. BANNERSHIP
2024 MEADE ST.
DENVER, COLORADO

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from front panel of cabinet.
2. Remove 2 metal screws located behind the picture and channel selector knobs.
3. Remove 12 wood screws. Remove rear cover.
4. Place receiver face down on a soft surface.
5. Remove 2 wood screws from interlock bracket.
6. Disconnect 5 yoke leads, speaker leads, picture tube socket and HV lead.
7. Remove 4 chassis bolts. Remove chassis.
8. Remove 4 speaker nuts. Remove speaker.



MODELS
TV1-9320A, TV1-9330A, TV1-9332A

CORONADO MODELS TV1-9320A, TV1-9330A, TV1-9332A

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet above and slightly to the left of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the set. Adjustment is located on tube side of chassis. Set the horizontal hold control to the center of its range and adjust the horizontal oscillator slug (L24) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control (R7) located on top of the chassis for maximum volume and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

HORIZONTAL SIZE CONTROL

The horizontal size control is located on the neck of the picture tube in form of a brass sleeve and slides between the yoke and picture tube. Push sleeve into yoke to decrease size and pull out to increase size.

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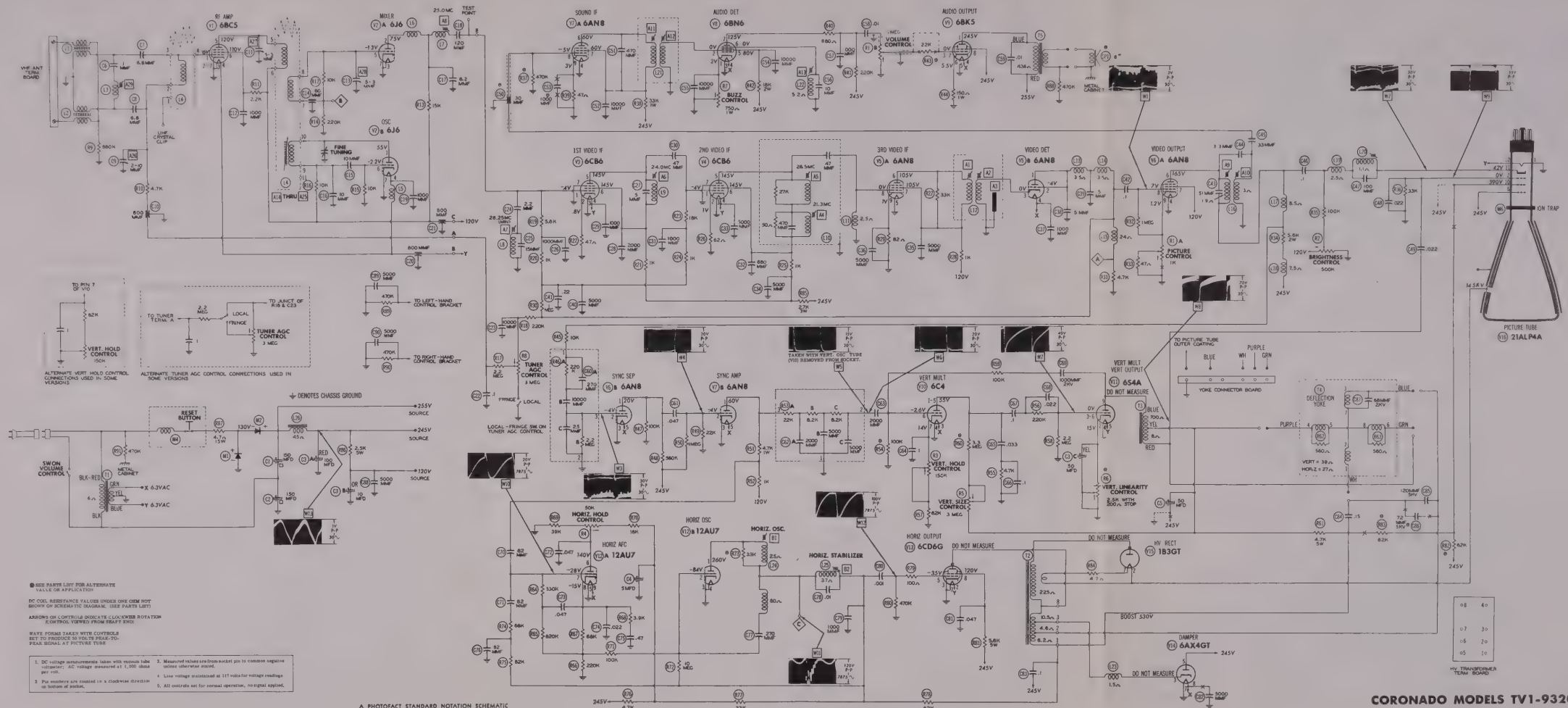
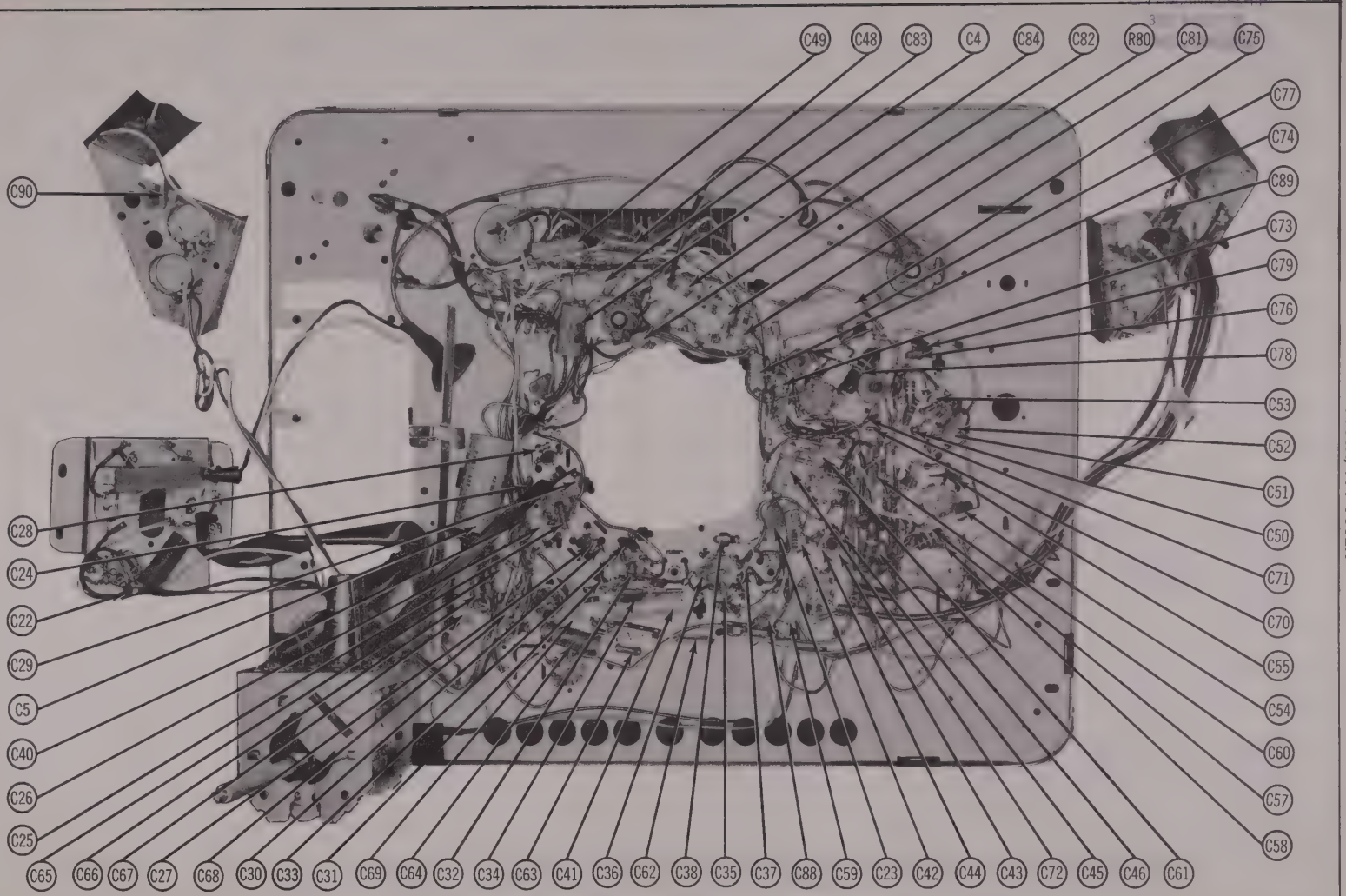
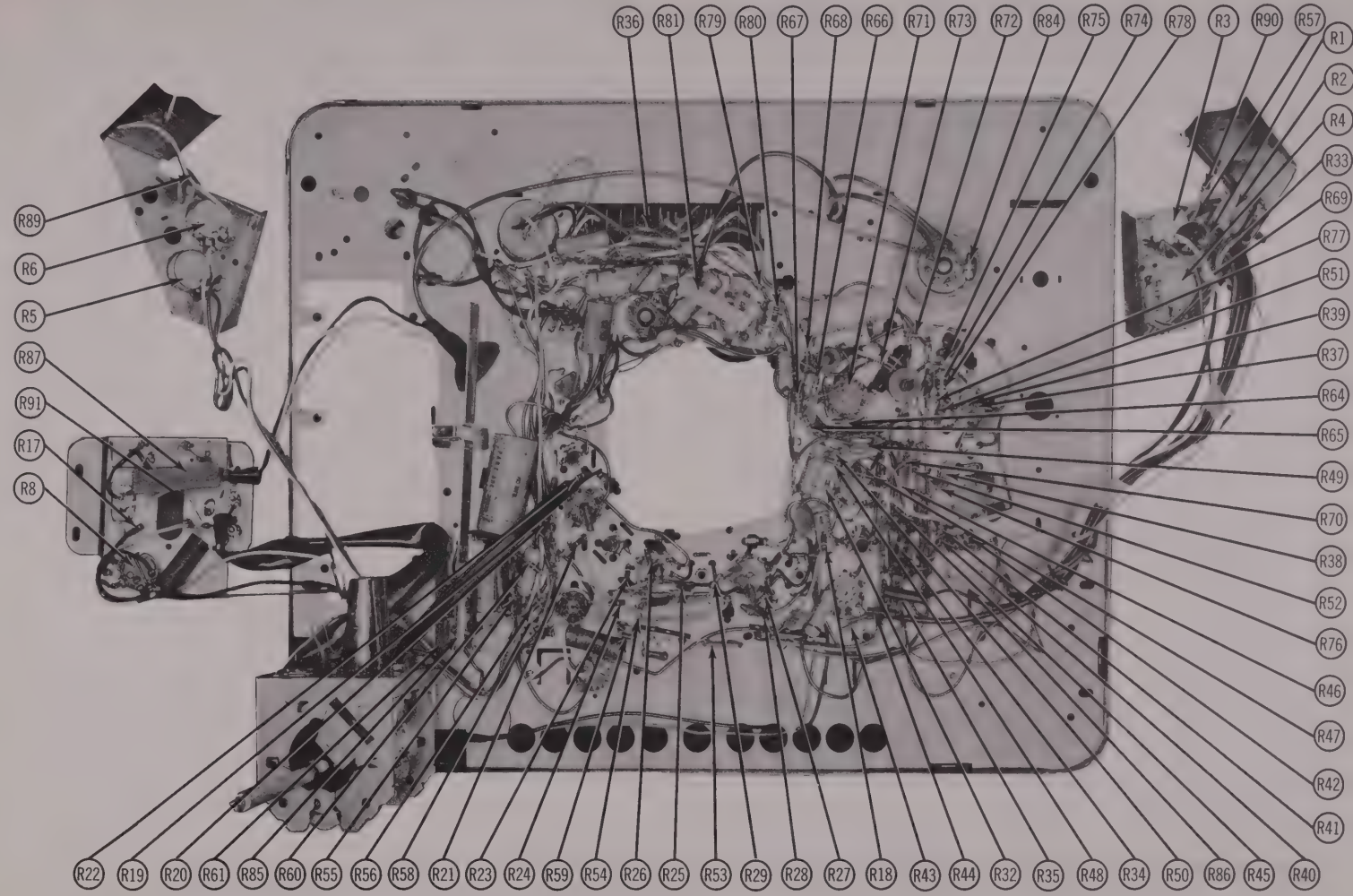


CORONADO MODELS TV1-9320A, TV1-9330A, TV1-9332A



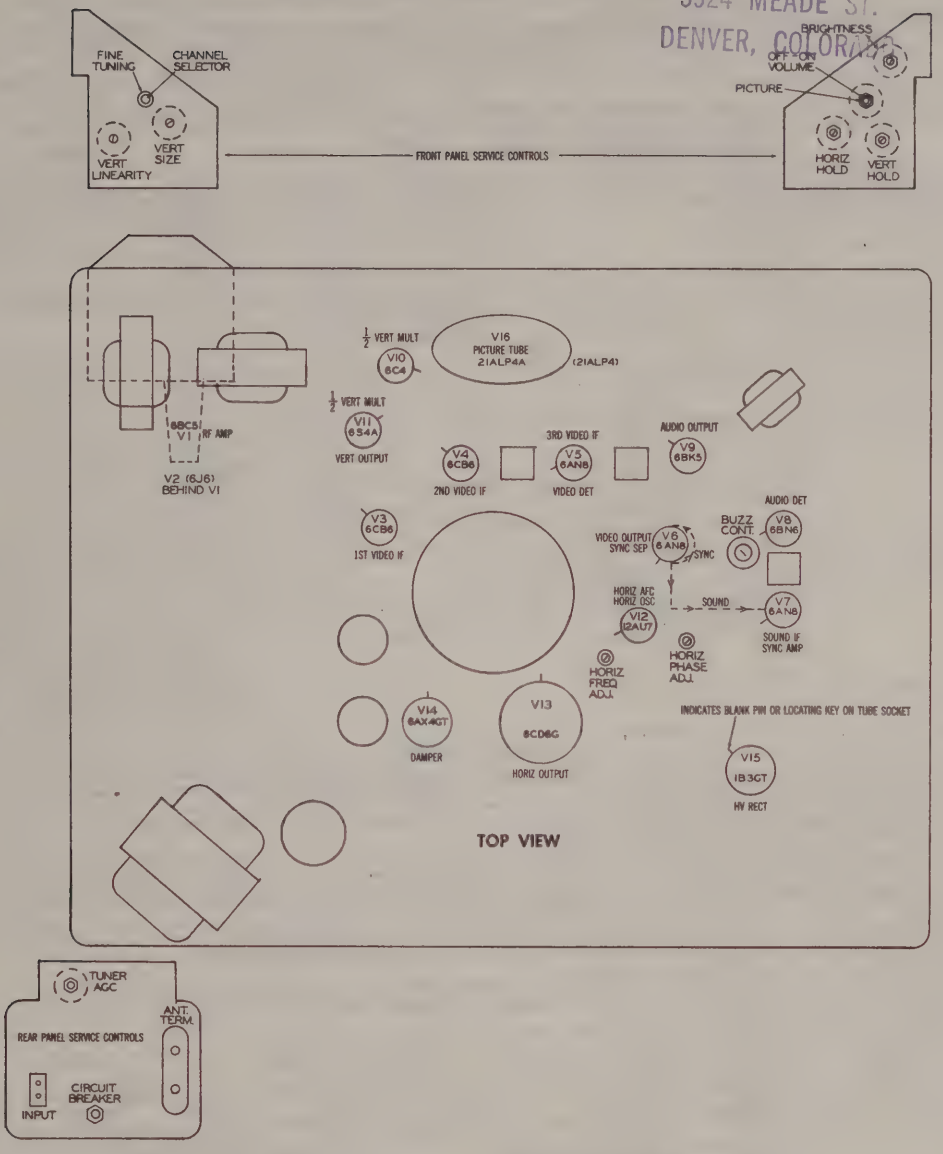
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPER
F. BLANK
3924 MEADE ST.
DENVER, COLORADO

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2), Circuit Breaker (M4)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V16
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V7, V10, V11
No horiz. sync - V7, V12
No vert. or horiz. sync - V6, V7

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V16
No vertical deflection - V10, V11
Poor vert. linearity or foldover - V10, V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V15, M1, M2
Vert. off freq. - V7, V10, V11
Horiz. off freq. - V7, V12

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped away from the chassis. Dot not remove the horizontal oscillator tube (V12) to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 8 (grid) of 6AN8 (V5). Low side to chassis.	25MC (10MC Swp.)	23. 9MC 26. 3MC	Any	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A1, A2, A3	Connect a short jumper from pin 5 (plate) to pin 6 (screen) of 6CB6 (V4). Adjust for response similar to Fig. 1 with markers at 90%. A3 is a coupling rod and affects bandwidth. Remove short from pin 5 to pin 6 of V4.
2.	Direct	High side to an unground ed tube shield floating over converter tube. Low side to chassis.	Not used	21. 3MC Unmod.	"	Use VTVM DC probe to point (A). Common to chassis.	A4	Adjust for maximum deflection.
3.	"	"	"	26. 5MC	"	"	A5	Adjust for maximum deflection. Repeat step 2.
4.	"	"	"	24. 0MC	"	"	A6	Adjust for maximum deflection. Attenuate generator to maintain not more than 2 volts deflection on VTVM.
5.	"	"	"	28. 25MC	"	"	A7	Adjust for MINIMUM deflection.
6.	"	"	"	25. 0MC	"	"	A8	Adjust for maximum reading. Attenuate generator to maintain not more than 2 volts deflection on VTVM. Repeat step 5.
7.	"	"	25MC (10MC Swp.)	21. 3MC 23. 8MC 26. 65MC	"	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Check for response similar to Fig. 2. Rock A8 for flat response. Increase sweep generator output and use high scope gain to view 22. 25MC trap region. Adjust A4 so that 21. 25MC appears at peak of pop-up portion proceeding trap notch. 22. 25MC should fall in trap notch. If response is not similar to Fig. 2, repeat steps 1 thru 7.

SOUND IF ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket. Tune in a TV signal and adjust the fine tuning control until sound bars just appear in the picture. Adjust A9 fully counter clockwise, and then clockwise until the horizontal scanning lines are smooth and continuous. Readjust the fine tuning control for clearest picture and best sound. Insert an attenuator in series with the antenna and the receiver antenna terminals so that signal strength may be varied from weak to strong. If a suitable attenuator is not available stray feed the signal to the set by placing the antenna lead-in near the antenna terminals of the receiver.
Reduce the signal input to the receiver so that the signal falls below the limiting level of the 6BN6 limiter-detector as evidenced by a "hiss" in the sound. Adjust the secondary of the sound take-off transformer (A10), the sound if transformer (A11 and A12), the quadrature coil (A13) and the buzz control (R7) for maximum sound and minimum buzz. If hiss disappears during adjustments, increase attenuation until hiss reappears.

OSCILLATOR ALIGNMENT

The channel oscillator adjustment screws are reached through a hole just to the left of the fine tuning shaft. The correct oscillator adjustment screw is accessible through this hole as the channel switch is turned to each channel. Connect the negative lead of a 1. 5 volt bias battery to the ungrounded side of C41. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp.)	193. 25MC 197. 75MC	10	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A14	Adjust to place sound marker in trap notch as in Fig. 3. Use high scope gain and increase sweep generator output to view trap region. Video marker should fall at 50% on response curve.
			213MC (10MC Swp.)	211. 25MC 215. 75MC	13		A15	
			207MC (10MC Swp.)	205. 25MC 209. 75MC	12		A16	
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11		A17	
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9		A18	
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8		A19	
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7		A20	
			85MC (10MC Swp.)	83. 25MC 87. 75MC	6		A21	
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5		A22	
			69MC (10MC Swp.)	67. 25MC 71. 75MC	4		A23	
			63MC (10MC Swp.)	61. 25MC 65. 75MC	3		A24	
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2		A25	

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Leave bias battery connected as under "Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp.)	193. 25MC 197. 75MC	10	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A26, A27, A28	Adjust for response similar to Fig. 4 with markers at 90%.
10.	"	"	69MC (10MC Swp.)	67. 25MC 71. 75MC	4	"		Check for response similar to Fig. 4. If markers fall below 70% on any channel, make SLIGHT compromise adjustments of A26, A27 and A28 with channel selector set for that channel. Recheck all other channels to make sure they have not been seriously affected.
			213MC (10MC Swp.)	211. 25MC 215. 75MC	13			
			207MC (10MC Swp.)	205. 25MC 209. 75MC	12			
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11			
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp.)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5			
			63MC (10MC Swp.)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2			
11.	"	"	Not used	105MC	2	Use VTVM DC probe to point (A). Common to chassis.	A29	Adjust for MINIMUM deflection.

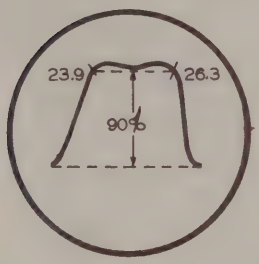


FIG.1

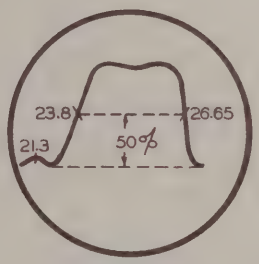


FIG.2

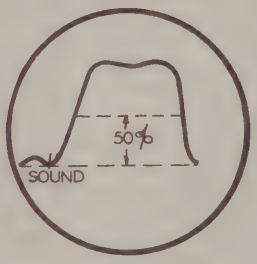


FIG.3

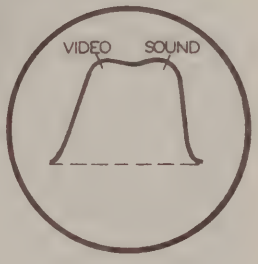
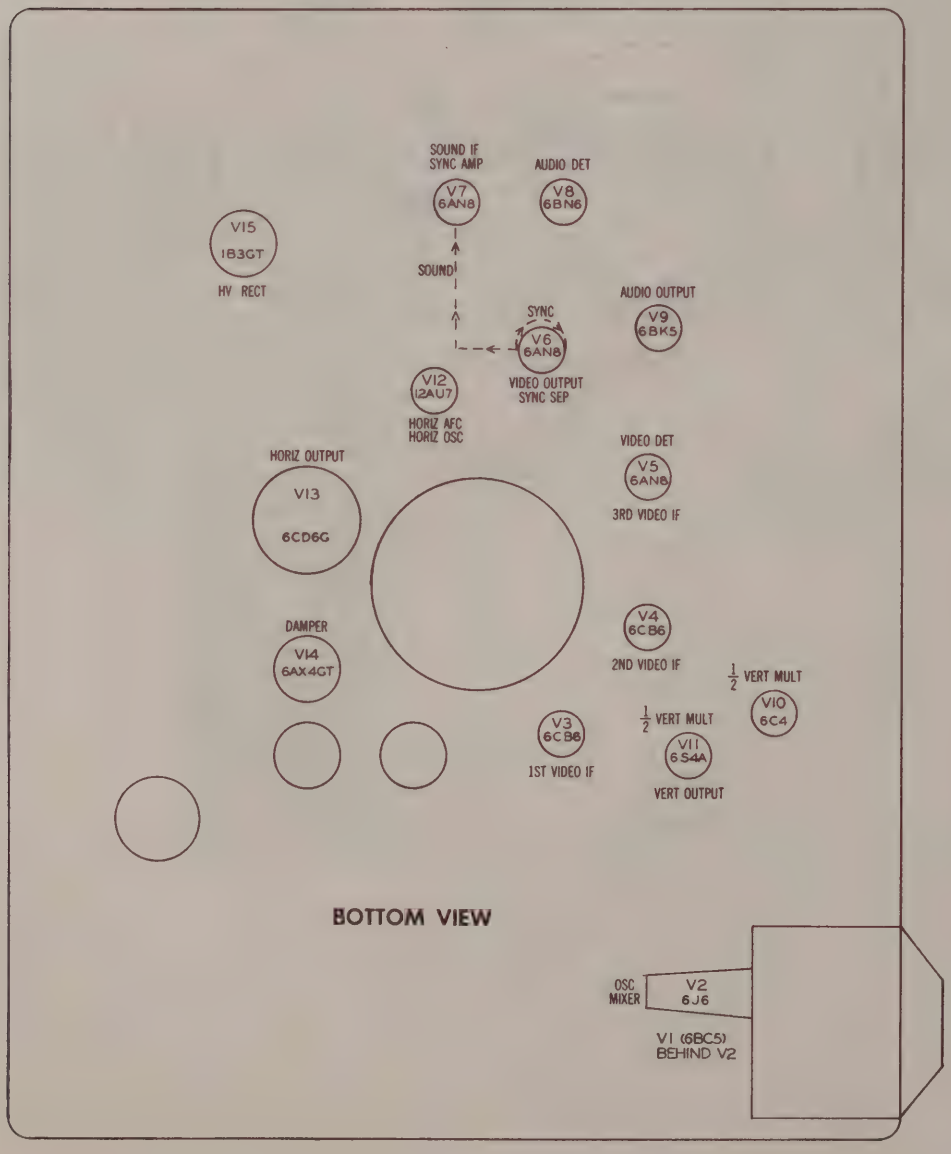


FIG.4

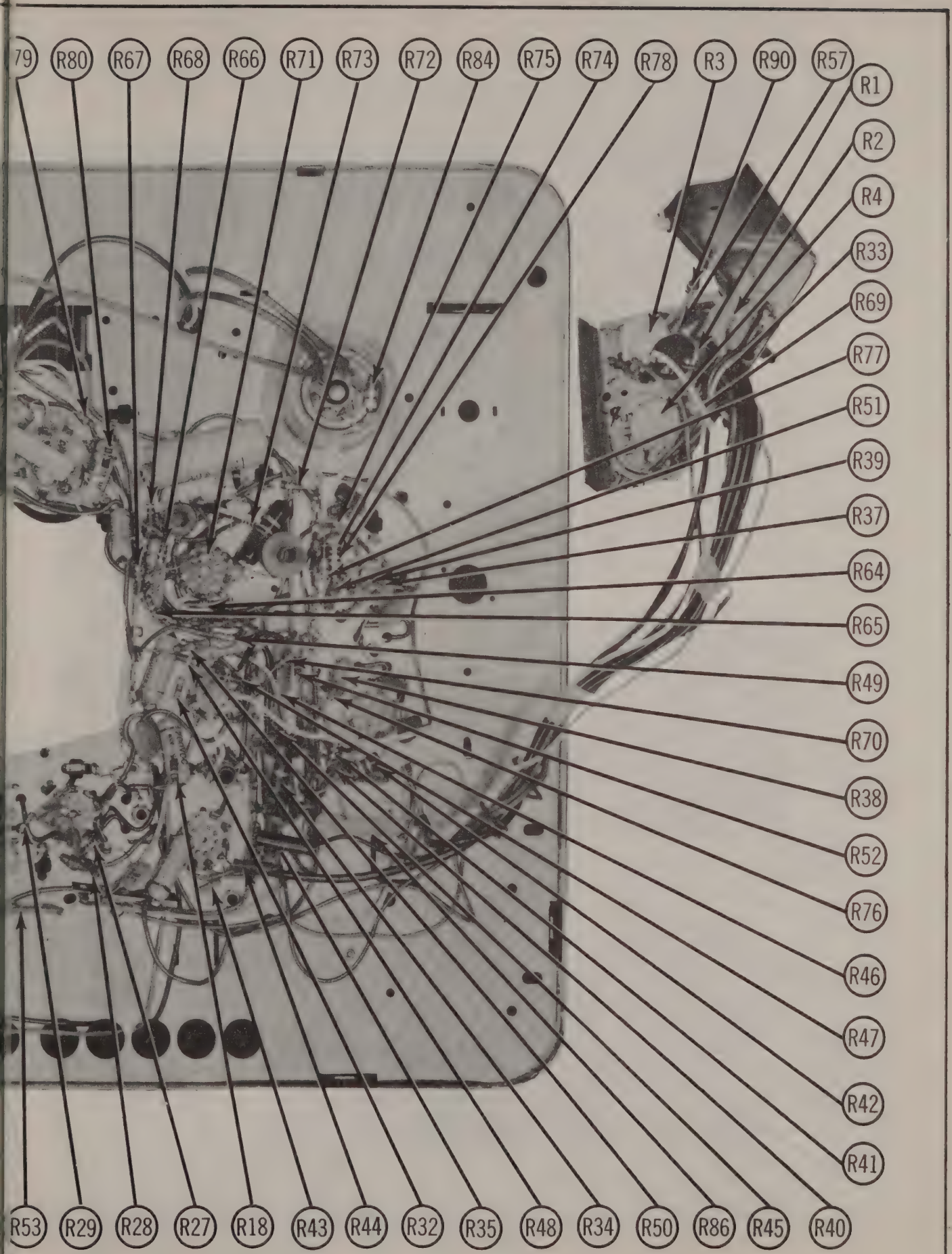
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	2.5Meg	0Ω	0Ω	.1Ω	† 2.5KΩ	† 4.7KΩ	0Ω		
V 2	6J6	† 13KΩ	† 18KΩ	0Ω	.1Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	1Meg	47Ω	0Ω	.1Ω	† 3.7KΩ	† 3.7KΩ	0Ω		
V 4	6CB6	1Meg	62Ω	0Ω	.1Ω	† 3.7KΩ	† 3.7KΩ	0Ω		
V 5	6AN8	4.7KΩ	4.7KΩ	.2Ω	.1Ω	0Ω	† 3.5KΩ	† 3.5KΩ	2.5Ω	82Ω
V 6	6AN8	† 110KΩ	2.2Meg	0Ω	0Ω	.1Ω	† 5.6KΩ	† 2.5KΩ	1Meg	60Ω
V 7	6AN8	† 8.2KΩ	22KΩ	0Ω	0Ω	.1Ω	† 33KΩ	† 33KΩ	470KΩ	47Ω
V 8	6BN6	200Ω	.3Ω	0Ω	.1Ω	† 18KΩ	5.2Ω	† 220KΩ		
V 9	6BK5	† 435Ω	NC	120KΩ	.1Ω	0Ω	150Ω	120KΩ	† 45Ω	TP
V 10	6C4	▲ 4.5Meg	NC	.1Ω	0Ω	▲ 4.5Meg	100KΩ	130KΩ		
V 11	6S4A	NC	550Ω	2.2Meg	0Ω	.1Ω	2.2Meg	NC	NC	▲ 5.4KΩ
V 12	12AU7	† 30KΩ	320KΩ	0Ω	0Ω	0Ω	† 30KΩ	1.5Meg	300KΩ	.1Ω
V 13	6CD6G	TP	.1Ω	0Ω	TP	470KΩ	TP	0Ω	† 5.6KΩ	TOP CAP ▲ 12Ω
V 14	6AX4GT	TP	NC	70KΩ	NC	† 45Ω	NC	0Ω	.1Ω	
V 15	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 237Ω
V 16	21ALP4A	0Ω	33KΩ	PIN 6 † 45Ω	PIN 10 ▲ 30KΩ	PIN 11 † 200KΩ	PIN 12 .1Ω			

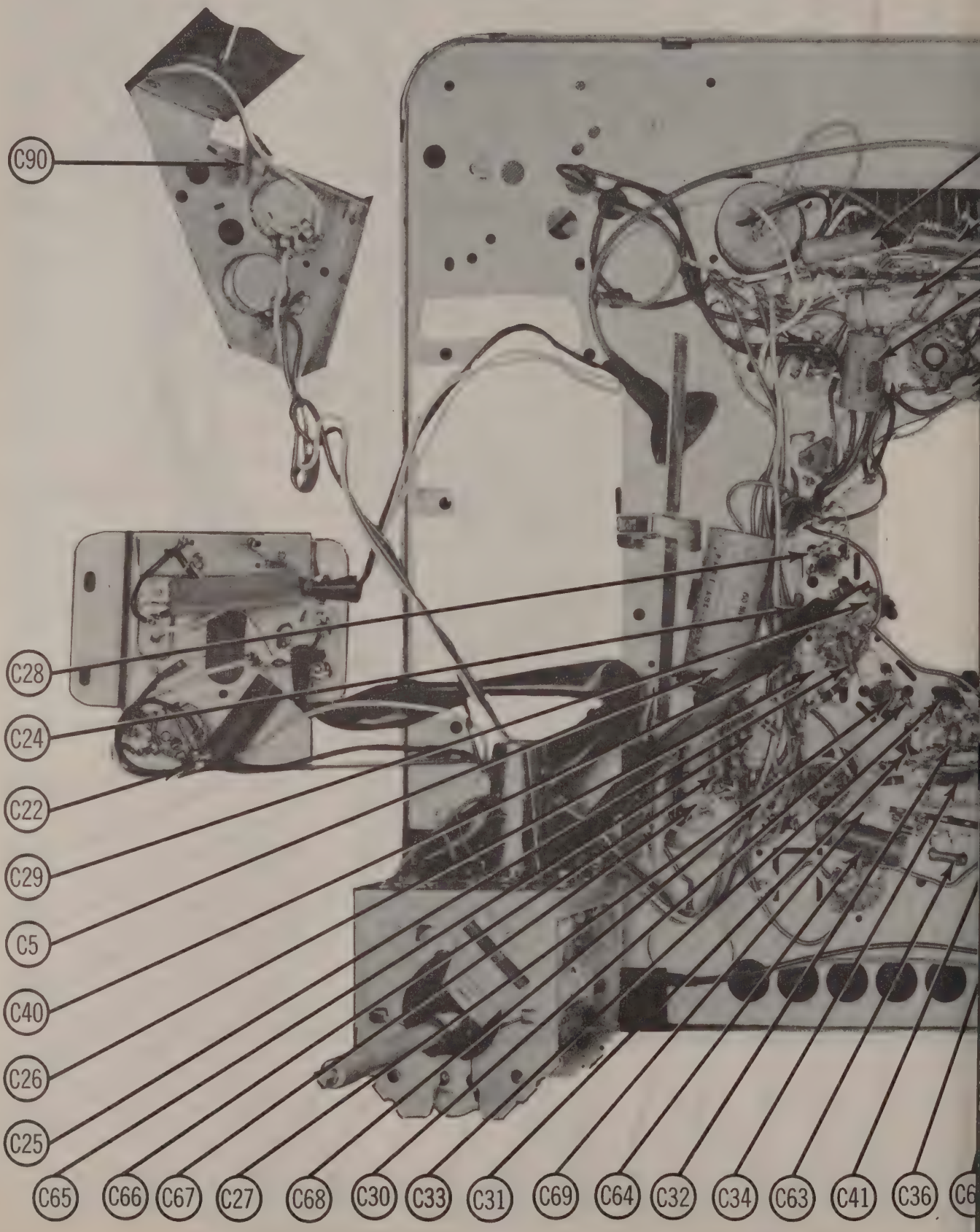
† MEASURED FROM OUTPUT OF M3.
▲ MEASURED FROM PIN 3 OF V14.
NC-NO CONNECTION
TP-TIE POINT



TUBE PLACEMENT CHART

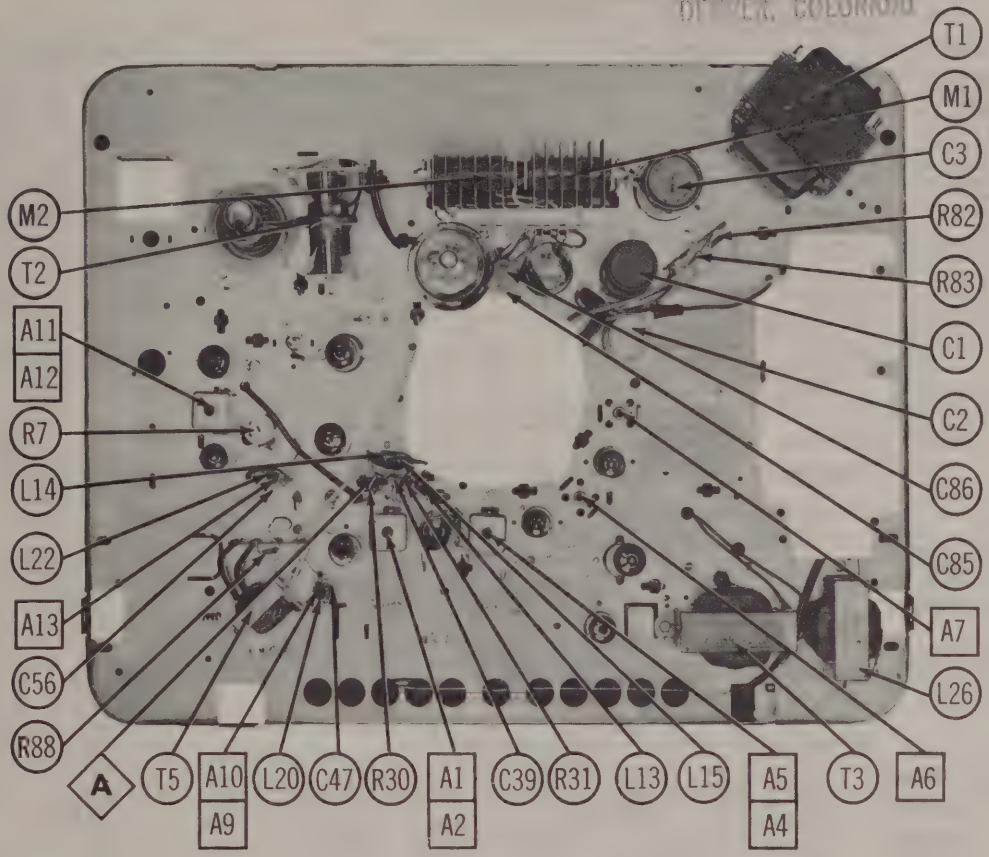


SISTOR IDENTIFICATION

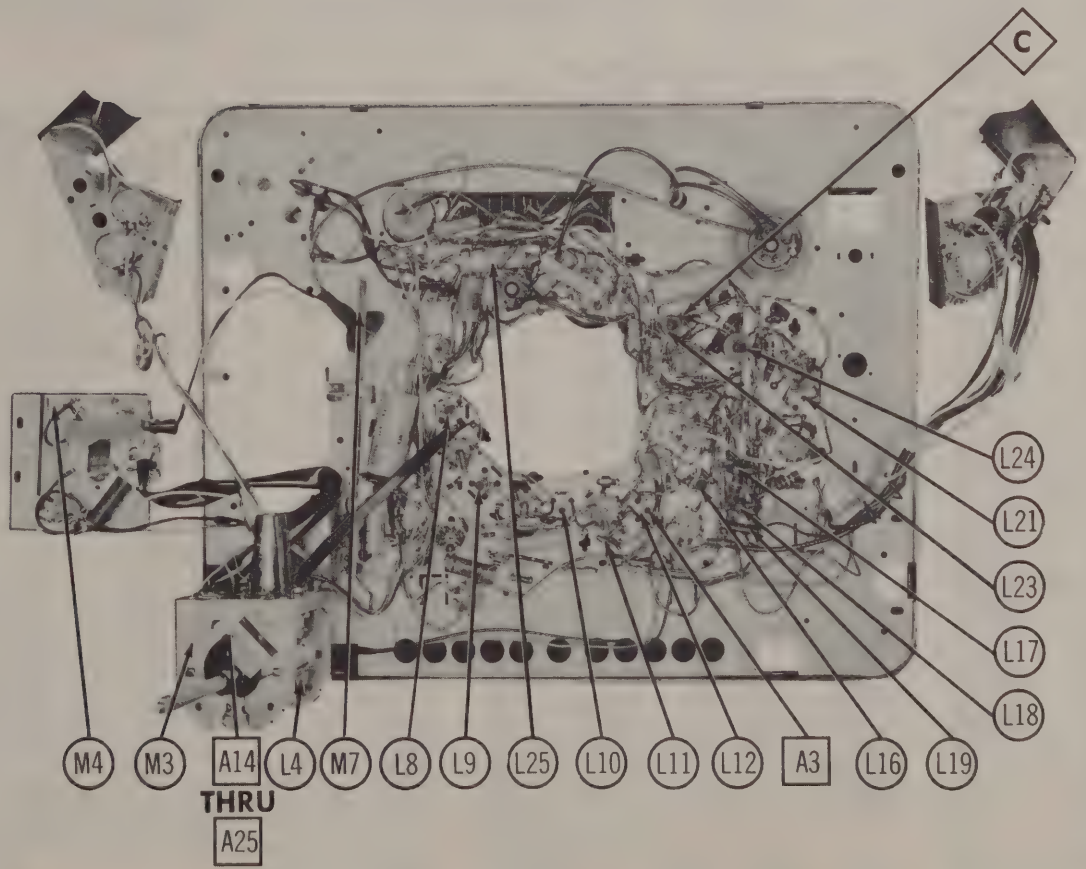


CHASSIS BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
DENVER, COLORADO



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	6BC5	6BC5	
V2	Mixer-Oscillator	6J6	6J6	
V3	1st. Video IF Amp.	6CB6	6CB6	
V4	2nd. Video IF Amp.	6CB6	6CB6	
V5	3rd. Video IF - Video Det.	6AN8	6AN8	
V6	Video Output-Sync Sep.	6AN8	6AN8	
V7	Sound IF - Sync Amplifier	6AN8	6AN8	
V8	Audio Detector	6BN6	6BN6	
V9	Audio Output	6BK5	6BK5	
V10	Vert. Mult.	6C4	6C4	
V11	Vert. Mult.-Vert. Output	6S4A	6S4A	
V12	Horiz. AFC-Horiz. Osc.	12AU7	12AU7	
V13	Horiz. Output	6CD6G	6CD6G	
V14	Damper	6AX4GT	6AX4GT	
V15	HV Rectifier	1B3GT	1B3GT	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: FIRESTONE PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V16	21ALP4A ①	21ALP4A① 21ALP4 21ALP4B ①	21ALP4A① 21ALP4 21ALP4A/B	21ALP4A② 21ALP4 21ALP4A/B ②	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	■150	150	8C-22464	AFH1-24	XA004	FP117	TM-150-150	T-050	TVL-1428
C2	■150	150	8C-22463	AFH1-24	XA004	FP117	TM-150-150	T-050	TVL-1428
C3A	100	300	8C-25308	AFH3-99-75		FP326.6	TM-3127	T-537	TVL-3574
B	10	300						MT-0525	
C	50	50							
C4	5	300	8C-24174	PRS350V4	BR435	TC60	TD-8-350	FM-3508	TVA-1601
C5	50	350	8C-25532	PRS350V50	BR5035	TC68	TD-60-350	FM-4550	TVA-1613

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	.1			NP0-S11	TCZ-1	TZ03	NP0A-010	ZT-5515	5TCCB-V1	
C7	6.8		13L8C6R81	NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C8	6.8		13L8C6R81	NP0-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C9	2-10		31B-901		829-10					
C10	800		13M-320EA-102ZC							
C11	.5-3		31B-902		829-3		3115-01-0R5	CT565A		
C12	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C13	.5-3		31B-902		829-3		3115-01-0R5	CT565A		
C14	60		13M-320Q-600J							
C15	10		13L8Q100A							
C16	10		13L8UA100D							
C17	8.2		13L8C8R2D	NP0-DI8.2		Z016	NP0A-8R2			
C18	120		13L8V121K	BPD-00012	DD-121	G044	811-121	UC-5312	5GA-T12	
C19	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C20	800		13M-320EA-102ZC							
C21	800		13M-320EA-102ZC							
C22	.1	200	8K-23084	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C23	10000		8G-20269	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C24	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C25	15			NP0-SI15	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C26	1000		8G-13201	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C27	5		8G-12166	NP0-SI5	TCZ-4R7	Z011	NP0A-050	ZT-555	5TCCB-V47	
C28	2000		8G-19522	SI2000	D6-202	TP56	GP2-333-202	UC-522	5HK-D2	
C29	1000		8G-13201	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C30	47		8G-19731	NP0-DI47	DD-470	Z033	831-470	MCB225	MS-447	
C31	1000		8G-13201	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C32	680		8G-21105	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C33	5000		8G-13962	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C34	5000		8G-13962	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C35	5000		8G-13962	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C36	5000		8G-13962	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C37	1000		8G-13201	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	5		8G-12166	NP0-SI5	TCZ-4R7	Z011	NP0A-050	ZT-555	5TCCB-V47	
C39	5		8G-12166	NP0-SI5	TCZ-4R7	Z011	NP0A-050	ZT-555	5TCCB-V47	
C40	5000		8G-13962	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C41	.22	200	8K-23086	P288N-22		CUB2P22		PT4022	2TM-P22	
C42	.1	200	8K-23084	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C43	51		8G-23793							
C44	3.3		8L-23551	NP0-SI3.3	TCZ-3R3	TZ06	NP0A-3R3	ZT-5533	5TCCB-V33	
C45	33		8G-19503	NP0-SI33	TCZ-33	TZ18	NP0L-330	ZT-5433	5TCC-Q33	
C46	.1	400	8K-23095	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C47	100		8N1-113	NP0-DI100	D6-101	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C48	.022	200	8K-23082	BPD-02	DD-203	CUB4S22	817-02	PT4122	2TM-S22	
C49	.022	600	8K-23104	BPD-02	DD-203	CUB6S22	817-02	PT6122	6TM-S22	
C50	30		14B-23772							Note 1
C51	470		8N1-121	1464-00047	D6-471	5R5T47	811-471	MCB245	10GA-T47	
C52	10000		8G-20269	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C53	1000		8G-13201	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Note 2
C54	10000		8G-20269	BPD-01	DD-103	K080	811-01	DC-511	5HK-S1	
C55	10000		8G-20269	BPD-01	DD-103	K080	811-01	DC-511	5HK-S1	
C56	10		8G-11789	NP0-SI10	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C57	1000		8G-13201	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C58	.01	400	8K-23091	BPD-01	DD-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C59	.01	600	8K-23102	BPD-01	DD-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C60A	270			BPD-00027		TP41	811-271	UC-5327	5GA-T27	
B	10000		†17A-24212	BPD-01	†PC-263	K082	811-01	DC-511	5HK-S1	
C	25			BPD-000025		TP25	831-250	UC-5425	5GA-Q25	
C61	.047	200	8K-23083	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C62A	2000							DC-522		
B	5000		♦17A-22376	♦PA-110	♦PC-100	♦115TM1	♦1405-01	DC-525	♦V-1	
C	5000							DC-525		
C63	2000		8G-19522	SI2000	D6-202	TP56	GP2-333-202	UC-522	5HK-D2	
C64	.1	200	8K-23084	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C65	.033	400	8K-23816			CUB6S33				
C66	.1	200	8K-23084	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	

PARTS LIST AND CAPACITO

ITEM No.	RATING: CAP.	RATING: VOLT	CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.
C67	.1	400	8K-23095	P488N-1	DF-104
C68	.022	200		BPD-02	DD-203
C69	1000	2000	8G-24991	HVD30-1000	DD30-102
C70	82		8N1-112	1469-000082	D6-820
C71	82		8N1-112	1469-000082	D6-820
C72	.047	400	8K-23094	BPD-05	DF-503
C73	.047	200	8K-23083	BPD-05	DF-503
C74	.022	200	8K-23082	BPD-02	DD-203
C75	.47	400	8K-23087	P488N-47	
C76	82		8N1-112	1469-000082	D6-820
C77	270		8N1-118	1469-00027	D6-271
C78	.01	600	8M-24439		
C79	1000		8N2-125	1464-001	
C80	.001	600	8K-23099	SI1000	D6-102
C81	.047	400	8K-23094	BPD-05	DF-503
C82	5000			BPD-005	DD-502
C83	.1	600	8K-23106	P688N-1	DF-104
C84	.15	200	8K-23085	P288-15	
C85	120	5000	8G-25325		DD60-121
C86	72	5000			
C87	68	2000		HVD-30-68	DD30-680
C88	5000		8G-13962	BPD-005	DD-502
C89	5000		8G-13962	BPD-005	DD-502
C90	5000		8G-13962	BPD-005	DD-502

Note 1. C50 is the capacity of the sound IF coupling shielded lead.
Note 2. Not used in some versions.
† Items C60A, C60B, C60C, R46A and R46B are combined in one u
♦ Items C62A, C62B, C62C, R53A, R53B and R53C are combined

CONTR

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT D: CORONADO PART No.	CENTRALAB PART No.	CLAROSTA PART No.
R1A	1000Ω	½	B10A-25102	F1-5	RTV-573
B	1Meg	½		R2-52	
C	Switch			KB-1	
R2A	500KΩ	½	B10B-25165	AB-59	A47-500K-S
B	Shaft		Not Req.	AK-4	KSS-3
R3A	150KΩ	½	B10B-25168	AB-43	A47-150K-S
B	Shaft		Not Req.	AK-4	KSS-3
R4A	50KΩ	½	B10B-25169	AB-31	A47-50K-S
B	Shaft		Not Req.	AK-4	KSS-3
R5A	3Meg	½	B10B-25167	B-84	A47-3Meg-
B	Shaft		Not Req.	Not Req.	KSS-3
R6A	2500Ω with 2000Ω stop	½	B10B-25605	B-7	♦A47-2500
B	Shaft		Not Req.	Not Req.	KSS-3
R7	750Ω	1	A10D-23857		39-750
R8A	3Meg	½	B10A-25667	B-84-S	A47-3Meg-
B	Shaft		Not Req.	Not Req.	KSS-3
C	Switch		Not Req.	Not Req.	SWE-12

♦ Connect a 220Ω resistor in series with the right hand terminals terminal of the original control (control viewed from shaft end, te
† Universal Replacement (Mallory Exact Duplicate Part No. UE6
• Concentrikit Equivalent: K-2 Kit, Base Elements and Shafts; B B 76

RESIST

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	NOTES
R9	680KΩ	½	9B1-30	BTS-680K	
R10	4700Ω	½	9B1-70	BTS-4700	
R11	2200Ω	½	9B1-66	BTS-2200	
R12	10KΩ	½	9B1-74		
R13	15KΩ	½	9B1-76		
R14	220KΩ	½	9B1-27	BTS-220K	
R15	10KΩ	½	9B1-74	BTS-10K	
R16	10KΩ	½	9B1-74		
R17	2.2Meg	½	9B1-102	BTS-2.2Meg	
R18	220KΩ	½	9B1-90	BTS-220K	
R19	5600Ω	½	9B1-71		
R20	1000Ω	½	9B1-62	BTS-1000	
R21	1000Ω	½	9B1-62	BTS-1000	
R22	47Ω	½	9B1-46	BTS-47	
R23	18KΩ	½	9B1-77		
R24	1000Ω	½	9B1-62	BTS-1000	
R25	1000Ω	½	9B1-62	BTS-1000	
R26	62Ω 5%	½	9B1-130	BTS-62	
R27	33KΩ	½	9B1-80		
R28	1000Ω	½	9B1-62	BTS-1000	
R29	82Ω	½		BTS-82	
R30	1Meg	½	9B1-98	BTS-1Meg	
R31	4700Ω	½	9B1-70	BTS-4700	
R32	1Meg	½	9B1-98	BTS-1Meg	
R33	47Ω	½	9B1-46	BTS-47	
R34	5600Ω	2	9B4-71	BTB-5600	
R35	100KΩ	½	9B1-86	BTS-100K	
R36	33KΩ	½	9B1-80	BTS-33K	
R37	470KΩ	½	9B1-86	BTS-470K	Note 1
R38	33KΩ	1	9B2-80	BTA-33K	
R39	47Ω	½	9B1-46	BTS-47	
R40	680Ω	½	9B1-60	BTS-680	
R41	220KΩ	½	9B1-90	BTS-220K	
R42	18KΩ	2	9B4-77	BTB-18K	
R43	22KΩ	2	9B1-78	BTS-22K	Note 2
R44	150Ω	1	9B2-52	BTA-150	
R45	10KΩ	½	9B1-74	BTS-10K	
R46A	220KΩ		† 17A-24212	BTS-220K	
B	2.2Meg			BTS-2.2Meg	
R47	100KΩ	½	9B1-86	BTS-100K	
R48	560KΩ	½	9B1-95	BTS-560K	
R49	22KΩ	½	9B1-78	BTS-22K	
R50	1Meg	½	9B1-98	BTS-1Meg	

Note 1. Some versions use a 100KΩ
Note 2. Not used in some versions.
Note 3. Some versions use a 47KΩ
Note 4. Some versions use a 4.7Meg
Note 5. Some versions use a 68KΩ
† Items R46A, R46B, C60A, C60B,
♦ Items R53A, R53B, R53C, C62A,

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	6BC5	6BC5	
V2	Mixer-Oscillator	6J6	6J6	
V3	1st. Video IF Amp.	6CB6	6CB6	
V4	2nd. Video IF Amp.	6CB6	6CB6	
V5	3rd. Video IF - Video Det.	6AN8	6AN8	
V6	Video Output-Sync Sep.	6AN8	6AN8	
V7	Sound IF - Sync Amplifier	6AN8	6AN8	
V8	Audio Detector	6BH6	6BH6	
V9	Audio Output	6BK5	6BK5	
V10	Vert. Mult.	6C4	6C4	
V11	Vert. Mult.-Vert. Output	6B4A	6B4A	
V12	Horiz. AFC-Horiz. Osc.	12AU7	12AU7	
V13	Horiz. Output	6CD6G	6CD6G	
V14	Damper	6AX4GT	6AX4GT	
V15	HV Rectifier	1B3GT	1B3GT	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: FIRESTONE Part No.	REPLACEMENT DATA: CBS Part No.	REPLACEMENT DATA: GENERAL ELECTRIC Part No.	REPLACEMENT DATA: SYLVANIA Part No.	NOTES
V16	21ALP4A ①	21ALP4A ①	21ALP4A	21ALP4A ② ③ 21ALP4 ② 21ALP4B ③	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: PYRAMID Part No.	REPLACEMENT DATA: SANGAMO Part No.	REPLACEMENT DATA: SPRAGUE Part No.
C1	ø150	150	8C-32464	AFH-34	XA004	FP117	TM-150-150	T-050	TVL-1428
C2	ø150	150	8C-32483	AFH-34	XA004	FP117	TM-150-150	T-050	TVL-1428
C3A	100	300	8C-33308	AFH3-99-75		FP336.5	TM-3127	T-537	TVL-3574
B	10	300						MT-0535	
C	50	50							
C4	5	300	8C-34174	PRS350V4	BR435	TC80	TD-B-350	FM-3508	TVA-1801
C5	50	350	8C-35532	PRS350V50	BR5035	TC68	TD-60-350	FM-4550	TVA-1613

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: SPRAGUE Part No.	NOTES
C6	.1		15LSCER1	NPO-E11	TCZ-1	TZ03	NPOA-010	ZT-5515	5TCCB-V1	
C7	6.8		15LSCER1	NPO-D15.8	TCZ-5R6	Z013	NPOA-5R6	ZT-5568	5TCCB-V58	
C8	5.8		15LSCER1	NPO-D15.8	TCZ-5R8	Z013	NPOA-5R8	ZT-5568	5TCCB-V58	
C9	2-10		31B-901		839-10					
C10	800		13M-332EA- 102SC							
C11	.5-3		31B-903		839-3		31L5-01-GR5	CT565A		
C13	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C13	.5-3		31B-903		839-3		31L5-01-GR5	CT565A		
C14	60		13M-330Q-606J							
C15	10		13LSQ10A							
C16	30		13LSQA30D							
C17	6.2		15LSCER1	NPO-D15.3		Z015	NPOA-5R2			
C18	120		31L5V12K	BPD-00013	DD-121	G044	611-131		UC-5312	5GA-T12
C19	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C20	800		13M-330EA- 102SC							
C21	800		13M-330EA- 102SC							
C22	.1	200	8K-33084	P388N-1	DF-104	CUB2P1		PT401	2TM-P1	
C23	10000		8G-33269	BPD-01	DD-103	KD82	811-01	DC-511	5HK-E1	
C24	3.3			NPO-E13.3	TCZ-3R3	TZ05	NPOA-3R3		5TCCB-V33	
C25	15			NPO-E15	TCZ-15	TZ11	NPOK-150		5TCC-Q15	
C26	1000		8G-13301	BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C27	5		8G-11266	NPO-E15	TCE-4R7	Z011	NPOA-050	ZT-555	5TCCB-V47	
C28	3000		8G-13153	SI600	DE-302	TP56	GP3-333-302	UC-5233	5HK-G3	
C29	1000		8G-13301	BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C30	47		8C-19751	NPO-D147	DD-470	Z033	831-470	MC5245	MS-447	
C31	1000		8G-13301	BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C32	680		8G-32105	SI680	DE-681	TP80	GP2K-681	UC-5268	5GA-T68	
C33	5000		8G-13963	BPD-005	DD-502	KD80	811-005	DC-525	5HK-D5	
C34	5000		8G-13963	BPD-005	DD-502	KD80	811-005	DC-525	5HK-D5	
C35	5000		8G-13963	BPD-005	DD-502	KD80	811-005	DC-525	5HK-D5	
C36	5000		8G-13963	BPD-005	DD-502	KD80	811-005	DC-525	5HK-D5	
C37	1000		8G-13301	BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1	
C38	5		8G-11266	NPO-E15	TCE-4R7	Z011	NPOA-050	ZT-555	5TCCB-V47	
C39	5		8G-11266	NPO-E15	TCE-4R7	Z011	NPOA-050	ZT-555	5TCCB-V47	
C40	5000		8G-13963	BPD-005	DD-502	KD80	811-005	DC-525	5HK-D5	
C41	.33	200	8K-33086	P388N-33		CUB2P33		PT6032	2TM-P33	
C42	.1	200	8K-33084	P388N-1	DF-104	CUB2P1		PT401	2TM-P1	
C43	51		8G-13793							
C44	3.3		15LSCER1	NPO-E13.3	TCZ-3R3	TZ06	NPOA-3R3	ZT-5533	5TCCB-V33	
C45	33		8G-13603	NPO-E33	TCZ-33	TZ18	NPOL-330	ZT-5433	5TCC-Q33	
C46	.1	400	8K-33085	P488N-1	DF-104	CUB4P1		PT404	4TM-P1	
C47	100		8G-13301	NPO-D100	DD-101	TZ30	NPO-330-101	ZT-521	5TCC-T1	
C48	.0033	200	8K-33080	BPD-00	DD-333	CUB4S23	617-023	PT4123	2TM-S23	
C49	.022	200	8K-33084	BPD-02	DD-303	CUB4S33	617-02	PT4122	4TM-S33	
C50	30		14B-32772							Note 1
C51	470		8G-13301		1454-00047	D6-471	SR5T47	611-471	MC5245	10GA-T47
C52	10000		8G-30269		BPD-01	DD-103	KD82	811-01	DC-511	5HK-E1
C53	1000		8G-13301		BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1
C54	10000		8G-30269		BPD-01	DD-103	KD82	811-01	DC-511	5HK-E1
C55	10000		8G-30269		BPD-01	DD-103	KD80	811-01	DC-511	5HK-E1
C56	10		8G-13793		NPO-E10	TCZ-10	TZ09	NPOA-100	DC-531	5TCC-Q1
C57	1000		8G-13301		BPD-001	DD-102	KD69	801-001	DC-521	5HK-D1
C58	.01	400	8K-33091		BPD-01	DD-103	CUB4S1	GP3-333-103	PT411	4TM-S1
C59	.01	600	8K-33103		BPD-01	DD-103	CUB6S1	GP3-333-103	PT611	6TM-S1
C60A	270				BPD-00027		TP41	831-271	UC-5227	5GA-T27
B	10000			†17A-34312	BPD-01	†PC-363	KD82	811-01	DC-511	5HK-E1
C	25				BPD-000025		TP25	831-250	UC-5425	5GA-Q25
C61	.047	200	8K-33083		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47
C62A	2000								UC-523	
B	5000			‡17A-32376	‡PA-110	‡PC-100	‡11ST1	‡1405-01	DC-525	‡V-1
C	5000								DC-525	
C63	3000		8G-19233		SI2000	D6-302	TP56	GP2-333-302	UC-532	5HK-D2
C64	.1	200	8K-33084		P388N-1	DF-104	CUB2P1		PT401	2TM-P1
C65	.033	400	8K-33092			DF-403	CUB4S33			
C66	.1	200	8K-33084		P388N-1	DF-104	CUB2P1		PT401	2TM-P1

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: SPRAGUE Part No.	NOTES
C67	.1	400	8K-33086	P488N-1		DF-104	CUB4P1		PT401	4TM-P1
C68	.022	200		BPD-02		DD-353	CUB4S23	617-02	PT4123	2TM-P23
C69	1000	3000	8G-34981	HVD30-1000		D30D-102		31KV-102	DC3021	30GA-D1
C70	82			SM1-13		1469-000082	D6-820	Z040	801-820	10GA-Q82
C71	82			SM1-12		1469-000083	D6-820	Z040	801-820	10GA-Q82
C72	.047	400	8K-33094	BPD-05		DF-503	CUB4S47		PT4147	4TM-S47
C73	.047	300	8K-33083	BPD-05		DF-503	CUB3S47		PT4147	3TM-S47
C74	.033	300	8K-33082	BPD-03		DD-303	CUB3S23	617-03	PT4133	3TM-S33
C75	.47	400	8K-33087	P488N-47			CUB4P47		PT4047	4TM-P47
C76	82			SM1-13		1469-000082	D6-820	Z040	801-820	10GA-Q83
C77	270			SM1-15		1469-00037	D6-271	TZ40	MC541	10GA-T27
C78	.01	600	8M-24439							
C79	1000		14B-32772	1454-001			BR5D1	611-103	MC5255	MS-31
C80	.001	600	8K-33099	SI1000		D6-102	CUB6D1	GP2L-102	PT621	6TM-D1
C81	.047	400	8K-33094	BPD-05		DF-503	CUB4S47		PT4147	4TM-S47
C82	5000			BPD-005		DD-503	KD80	811-005	DC-525	5HK-D5
C83	.1	600		P688N-1		DF-104	CUB6P1		PT601	6TM-P1
C84	.15	200		P388-15			CUB2P15		PT4615	2TM-P15
C85	120	5000	8G-33235			DD60-121				
C86	72	5000								Note 2
C87	68	2000				HVD-30-68	D30D-680	V3Q68	31KV-680	DC30468	30GA-Q68
C88	5000		8G-13963		BPD-005	DD-502	KD80	811-005	DC-525	5HK-D5
C89	5000		8G-13963		BPD-005	DD-502	KD80	811-005	DC-525	5HK-D5
C90	5000		8G-13963		BPD-005	DD-502	KD80	811-005	DC-525	5HK-D5

Note 1. C50 is the capacity of the sound IF coupling shielded lead.
Note 2. Not used in some versions.
† Items C58A, C60B, C60C, R45A and R45B are combined in one unit.
‡ Items C62A, C62B, C62C, R53A, R53B and R53C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CLAROSTAT Part No.	REPLACEMENT DATA: IRC Part No.	REPLACEMENT DATA: MALLORY Part No.	INSTALLATION NOTES
R1A	1000	½	B10A-35103	F1-5	RTV-575	*QJ-907	UF131	Picture (Panel)
B	1Meg	½		R2-53			UB18A	Volume (Rear)
C	Switch			R3-1			UB-26	Attach to R1B.
R2A	500KΩ	½	B10B-35165	AB-59	A47-500K-S	QJ1-133	U-50	Brightness
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R2A.
R3A	150KΩ	½	B10B-35168	AB-43	A47-150K-S	QJ1-129	U-43	Vert. Hold
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R3A.
R4A	50KΩ	½	B10B-35169	AB-31	A47-50K-S	QJ1-123	U-35	Horiz. Hold
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R4A.
R5A	2Meg	½	B10B-35167	B-84	A47-2Meg-S	QJ1-140	U089	Vert. Size
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Attach to R5A.
R6A	2500Ω with 500Ω stop	½	B10B-35805	B-7	‡ A47-3500-S	‡ QJ1-113	‡ TA3S2L	Vert. Linearity
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Attach to R6A.
R7	75KΩ	½	A10D-33857		35-750			Buzz-Wire Wound
R8A	2Meg	½	B10A-35867	B-84-S	A47-2Meg-S	QJ1-140	U-59	Tuner AGC
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Attach to R8A.
C	Switch		Not Req.	Not Req.	SW2-13	76-1	UA3S2L	Attach to R8A.

* Connect a 220Ω resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
† Universal Replacement (Mallory Exact Duplicate Part No. UE57S).
‡ Concentrbit Equivalent: K-5 Kit, Base Elements and Shafts; B17-108 & P1-226 (Panel)
B13-137 & R2-310 (Rear)
76-1 (Switch)

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R9	680KΩ	½	9BI-30	BTS-680K	
R10	470KΩ	½	9BI-70	BTS-470K	
R11	2200Ω	½	9BI-86	BTS-2200	
R12	1Meg	½	9BI-74		
R13	18KΩ	½	9BI-76		
R14	220KΩ	½	9BI-27	BTS-220K	
R15	330Ω	½	9BI-70	BTS-33R	
R16	10KΩ	½	9BI-74		
R17	2.2Meg	½	9BI-103	BTS-2.2Meg	
R18	2200Ω	½	9BI-80	BTS-220X	
R19	5600Ω	½	9BI-71		
R20	1000Ω	½	9BI-81	BTS-1000	
R21	1000Ω	½	9BI-83	BTS-1000	
R22	47Ω	½	9BI-46	BTS-47	
R23	18KΩ	½	9BI-77		
R24	1000Ω	½	9BI-83	BTS-1000	
R25	1000Ω	½	9BI-81	BTS-1000	
R26	820 5%	½	9BI-130	BTS-82	
R27	33KΩ	½	9BI-80		
R28	1000Ω	½	9BI-83	BTS-1000	
R29	82Ω	½	9BI-98	BTS-82	
R30	1Meg	½	9BI-74	BTS-1Meg	
R31	4700Ω	½	9BI-70	BTS-4700	
R32	1Meg	½	9BI-88	BTS-1Meg	
R33	47Ω	½	9BI-46	BTS-47	
R34	5600Ω	½	9BI-71	BTS-5600	
R35	1000Ω	½	9BI-86	BTS-100K	
R36	33KΩ	½	9BI-80	BTS-33K	
R37	470KΩ	½	9BI-86	BTS-470K	Note 1
R38	33KΩ	½	9BI-80	BTA-33K	
R39	47Ω	½	9BI-46	BTS-47	
R40	56ΩΩ	½	9BI-50	BTS-560	
R41	330KΩ	½	9BI-90	BTS-330K	
R42	18KΩ	2	9B4-77	BTB-18K	
R43	22KΩ	½	9BI-78	BTS-22K	Note 2
R44	150Ω	½	9B2-52	BTA-150	
R45	10KΩ	½	9BI-74	BTS-10K	
R46A	220KΩ	½	†17A-34312	BTS-220K	
B	2.2Meg	½		BTS-2.2Meg	
R47	100KΩ	½	9BI-86	BTS-100K	
R48	560KΩ	½	9BI-95	BTS-560K	
R49	33KΩ	½	9BI-76	BTS-33K	
R50	1Meg	½	9BI-88	BTS-1Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FIRESTONE Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R51	470Ω	1	9B3-70	BTA-4700	
R52	100ΩΩ	1	9B1-52	BTS-1000	
R53A	22KΩ			BTS-22K	
B	820ΩΩ		‡ 17A-32376	BTS-8200	
C	820ΩΩ			BTS-8200	
R54	100KΩ	½	9BI-86	BTS-100K	Note 3
R55	4700Ω	½	9BI-70	BTS-4700	
R56	220KΩ	½	9BI-88	BTS-220K	
R57	82KΩ	½	9BI-95	BTS- 82K	
R58	2.2Meg	½	9BI-103	BTS-2.2Meg	
R59	100KΩ	½	9BI-86	BTS-100K	
R60	2.2Meg	½		BTS-2.2Meg	Note 4
R61	4700Ω	5	9C12-1107		
R62	56ΩΩ	½	9BI-59		
R63	56ΩΩ	½	9BI-59		
R64	330KΩ	½	9BI-92		
R65	330KΩ	½	9BI-97	BTS-330K	
R66	220KΩ	½	9BI-90		
R67	68KΩ	½	9BI-84		
R68	39ΩΩ	½	9BI-69		
R69	39KΩ	½	9BI-81	BTS-39K	
R70	33KΩ	½	9BI-77		
R71	100KΩ	½	9BI-86	BTS-100K	
R72	10Meg	½	9BI-110		
R73	33KΩ	½	9BI-80		Note 5
R74	68KΩ	½	9BI-84		
R75	82KΩ	½	9BI-95		
R76	4700Ω	½	9BI-17		
R77	33KΩ	½	9BI-80		
R78	82KΩ	½	9B2-95		
R79	100Ω	½	9BI-50	BTS-100	
R80	470KΩ	½	9BI-94		
R81	560ΩΩ	½	9C12-1108		
R82	82K	½	9BI-95	BTS-82K	Note 2
R83	82K	½	9BI-95	BTS-82K	Note 2
R84	4.7Ω	½	9C1-1071	BW½-4.7	
R85	3700Ω	3	9C11-1094		
R86	2500Ω	25	9C-34019	PW7-2500	
R87	4.7Ω	15	9C-35868		
R88	470KΩ	½	9BI-29	BTS-470K	
R89	470KΩ	½	9BI-29	BTS-470K	
R90	470KΩ	½	9BI-29	BTS-470K	
R91	470KΩ	½	9BI-29	BTS-470K	

Note 1. Some versions use a 100KΩ ½W resistor in this application.
Note 2. Not used in some versions.
Note 3. Some versions use a 47KΩ ½W resistor in this application.
Note 4. Some versions use a 4.7Meg ½W resistor in this application.
Note 5. Some versions use a 68KΩ ½W resistor in this application.
† Items R46A, R46B, C60A, C60B, C60C are combined in one unit.
‡ Items R53A, R53B, R53C, C62A, C62B, C62C are combined in one unit.

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: Halldorson Part No.	REPLACEMENT DATA: Merit Part No.	REPLACEMENT DATA: Stancor Part No.	REPLACEMENT DATA: Thordorson Part No.	REPLACEMENT DATA: Triad Part No
T1	115VAC	12.6VCT ③ 4.85A			12D-35563	PS305 ③	PS365 ③		21F24 ②	F-42A ①

① Parallel and phase 12.6V windings.
② Connect 6.3V ③ 2A in series and phase,tape 6. SVCT.
③ Parallel and phase 2-13V ③ 3A windings to obtain 13V ③ 6A.
④ Drill new mounting holes.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: Halldorson Part No.	REPLACEMENT DATA: Merit Part No.	REPLACEMENT DATA: RCA TYPE No.	REPLACEMENT DATA: Ram Part No.	REPLACEMENT DATA: Stancor Part No.	REPLACEMENT DATA: Thordorson Part No.	REPLACEMENT DATA: Triad Part No.
T2	Horiz. Output Trans.	12E-35453	FB648 *	HVD-58 *		X1B6 *		F1Y-80 *	D-85 *
T3	Vert. Output Trans.	12E-19048-3	Z1900 ① ②	A-3038 ①	132721 ①	A-8143 ①		26S53 ①	A-996 ①
T4A	Yoke(90°) Horiz. (15.5MH)	20I-25380	DF807 ③	MDF-92 ③ ④	23SD1 ③	Y90P10/43 ③ ④	DY-16A ③	T-16 ③	Y-41-i ③
B	Vert. (39MH)	16M-25770 ③							

① Connect as sub transformer.
② Use 10 to 1 turns ratio.
③ Drill new mounting hole(s).
④ Yoke rear cover and centering device.
⑤ Use original rear cover and centering device.
⑥ Loosen and rotate core clamp to duplicate original shield mounting
⑦ Connect horizontal damping network across terminals #3 and #7. Use original if necessary.
⑧ Use original horizontal yoke damping network if necessary.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
8	8	8	8	8	8	8	8
3	3	3		6		6	3
2	3	3		6		6	3
1	6	8		2		2	6

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: Halldorson Part No.	REPLACEMENT DATA: Merit Part No.	REPLACEMENT DATA: Stancor Part No.	REPLACEMENT DATA: Thordorson Part No.	REPLACEMENT DATA: Triad Part No	NOTES
T5	6.3KΩ	3-4Ω	12C-23704	Z1900	A2931	A3856	26S48	S-7X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: QUAM Part No.	REPLACEMENT DATA: RCA TYPE No.	NOTES
SP1	6"	PM	3-4Ω	18A-31433	6A1	229S1	Used in Models TV1-9330A, TV1-9332A
	5"	PM	3-4Ω	18A-24682	5A07	205S2	Used in Model TV1-9320A

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: CORONADO Part No.	REPLACEMENT DATA: MEISSNER Part No.	REPLACEMENT DATA: MERIT Part No.	REPLACEMENT DATA: MILLER Part No.	NOTES
L1	Ant. Matching Trans.	0Ω	0Ω	31T-426				
L2	Ant. Matching Trans.	0Ω	0Ω	31T-426				
L3	IF Trap	.3Ω		31T-424				
L4A	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-32-CA				Channel 2
B	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-33-CA				Channel 3
C	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-34-CA				Channel 4
D	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-35-CA				Channel 5
E	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-36-CA				Channel 6
F	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-37-AA				Channel 7
G	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-38-AA				Channel 8
H	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-39-AA				Channel 9
I	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-40-AA				Channel 10
J	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-41-AA				Channel 11
K	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-42-AA				Channel 12
L	Ant., RF, Mixer Grid, Osc. Coils	0Ω		31M-43-AA				Channel 13
L5	Fil. Choke	0Ω		33A-157-01				
L6	RF Coil	0Ω		31G-502				
L7	1st Video IF	.9Ω		31U-502				
L8	23.25MC Trap	.3Ω		13M-25686				
L9	2nd Video IF	.1Ω		201-23829				
L10	3rd Video IF	.1Ω		201-24043				Tapped-Includes resistors & caps. 36 Microhenries
L11	RF Choke	2.5Ω		201-30266	19-3036	TV-180	6176	
L12	4th Video IF	.3Ω	.3Ω	13B-23867				
L13	4.5MC Peaking Coil	3.5Ω		16A-23233	19-6022		6153	33 Microhenries

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L14	Series Peaking Coil	3.5Ω		16A-22923	19-6022		6152	22 Microhenries
L16	Shunt Peaking Coil	24Ω		16A-19365	19-4400	TV-190	4648	410 Microhenries
L16A B	4.5MC Trap 1st Sound IF	1.9Ω 3Ω		201-23729				
L17	Series Peaking Coil	8.5Ω		16A-21391	19-3300		6155	305 Microhenries
L18	Shunt Peaking Coil	7.5Ω		16A-20970	19-3250	TV-185	6181	270 Microhenries
L19	Series Peaking Coil	2.5Ω		16A-24090	19-1005		4612	11 Microhenries
L20	4.5MC Trap	1.1Ω		16A-25441	20-1004	TV-151	1469	
L21	2nd Sound IF	.3Ω	.3Ω	201-23873				
L22	Quadrature Coil	5.2Ω		201-23727			1480	
L23	RF Choke	1.5Ω		16A-21701	19-1005		4612	8 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L24	85Ω		12E-24440			6212				Horiz. osc. tapped @60Ω, core part #51A-24699
L25	37Ω		13M-24441			6314				Horiz. stabilizer core part #51A-24699

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L26	.290A	45Ω	1.5HY	16B-25146	C5037①	C2996 ①	C2326 ①	26C44	C-17X ①

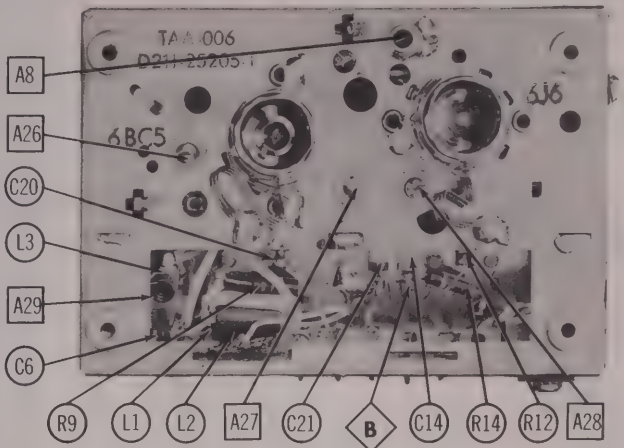
① Drill one new mounting hole.

SELENIUM RECTIFIER

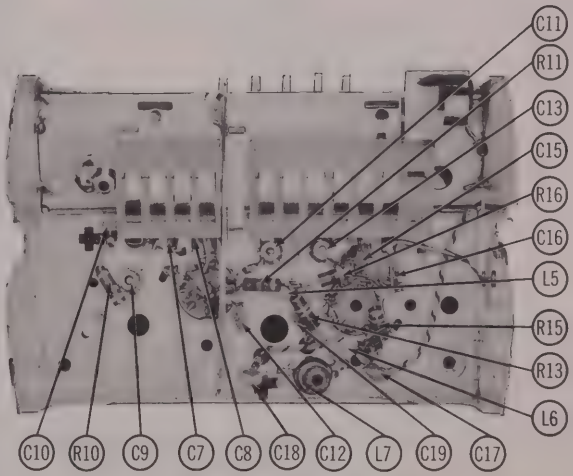
ITEM No.	RATING CURRENT	REPLACEMENT DATA CORONADO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.320A DC	21J25315	1241A	MR350	6S350	6QA2	350A	
M2	.320A DC	21J25315	1241A	MR350	6S350	6QA2	350A	

MISCELLANEOUS

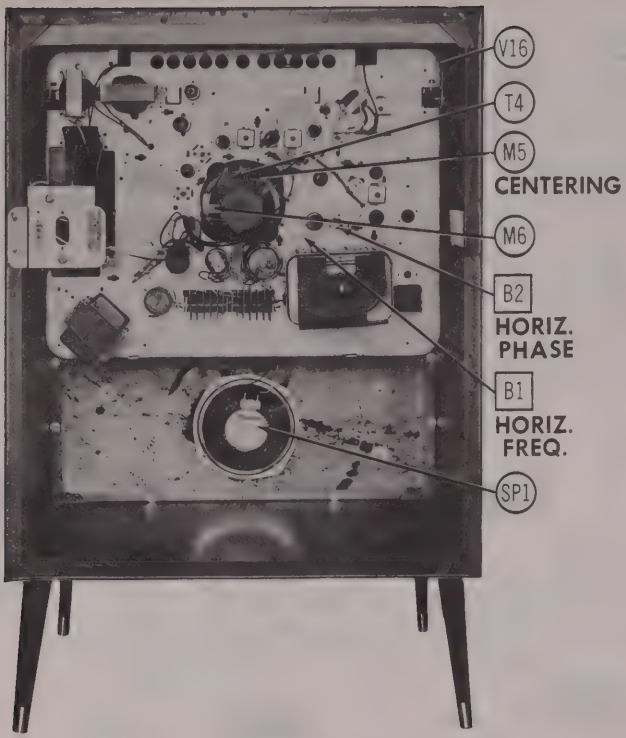
ITEM No.	PART NAME	CORONADO PART No.	NOTES
M3	Tuner	D2ll-25205-1	VHF (Pentode)
M4	Circuit Breaker	20F-25568	Low voltage protection
M5	Centering Device	16M-23770	Includes deflection yoke (T4) rear cover
M6	Ion Trap	16M-19705	
M7	Correction Magnet	B16M-22873	
	Cabinet Assy.	200-25382	Model TV1-9330A
	Cabinet Assy.	200-25382-1	Model TV1-9332A
	Cabinet Assy.	200-25381	Model TV1-9320A
	Knob	5B-25184-A56	Station selector
	Knob	5B-25177-A29	Fine tuning
	Knob	5B-25183-A56	On-off-volume
	Knob	5B-25178-A29	Picture
	Knob	5B-25176-A29	Control (3 used)
	Safety Glass	30M-25204	



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the horizontal hold control (R4) to its mid-range position.

Connect a short clip lead across L35) Adjust horizontal oscillator slug (S1) until the picture synchronizes horizontally. Remove clip lead from L35. Connect the vertical amplifier of the oscilloscope thru a low capacity probe to point ⏚. Low side to chassis. Adjust the horizontal stabilizer coil slug (S2) until a waveform similar to Fig. 5 is obtained. While making this adjustment, keep the picture in sync with the horizontal hold. Remove scope connection. Check range of horizontal hold control (R4). Turn R4 fully counter clockwise then back clockwise. The picture should fall out of sync at each extreme setting of R4.

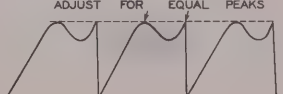


FIG. 5

PROPERTY OF
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[illegible]ORADO

CROSLEY MODELS JC-6BK, BN, TN, WE (Ch. R103)

CROSLEY MODELS JC-6BK, BN, TN, WE (Ch. R103)

TRADE NAME	Crosley Models JC-6BK, JC-6BN, JC-6TN, JC-6WE (Ch. R103)
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
* 1.	200MMF	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

* Connect 33KΩ resistor from pin 7 of V1 to B-. Disconnect antenna.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

CROSLEY
MODEL JC-6BK (Ch. R103)

PARTS LIST AND DESCRIPTIONS (Continued)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det.-AVC-AF Amplifier	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CROSLEY PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	170797-2	4A07	223S1	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	CROSLEY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	159348-1	AFH2-15	B015	FP213	TMD12	D-065	TVL-2432
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CROSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.068	200	159505-3						2SE-S68	
C3	.068	400	159505-5						2SE-S68	
C4	39		170194-4							
C5A	220									
B	2000									
C	5000		♦158110-3	♦PA-511						
D	250									
E										
C6	.022	200	159505-1	BPD-02	DD-203	K085	817-02		2SE-S22	
C7	.047	200	195505-2	BPD-05	DF-503			PTS4147	2SE-S47	

♦ Items C5A, C5B, C5C, C5D, C5E, R7A, R7B and R7C are combined in one unit. When replacing items separately, C5D and C5E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CROSLEY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500KΩ	½	C159568-1				TA55A	Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CROSLEY PART No.	IRC PART No.	
R2	22KΩ		39374-41	BTS-22K	
R3	10Ω		39374-1	BTS-10	
R4	2.2Meg		39374-69	BTS-2.2Meg	
R5	68Ω		39374-11	BTS-68	
R6	47KΩ		39375-89	BTS-47K	
R7A	6.8Meg		♦158110-3	BTS-6.8Meg	
B	470KΩ			BTS-470K	
C	470KΩ			BTS-470K	
R8	150Ω		39374-15	BTS-150	
R9	1000Ω	1	39374-113	BTA-1000	

♦ Items R7A, R7B, R7C, C5A, C5B, C5C, C5D, C5E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CROSLEY PART No.	Hallidorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.6KΩ	3-4Ω	170933-1-3	Z1101 ①	A-3025 ①	A-3332 ①	26S58 ②	S-12X ①	① Use original channel ② Drill mounting holes

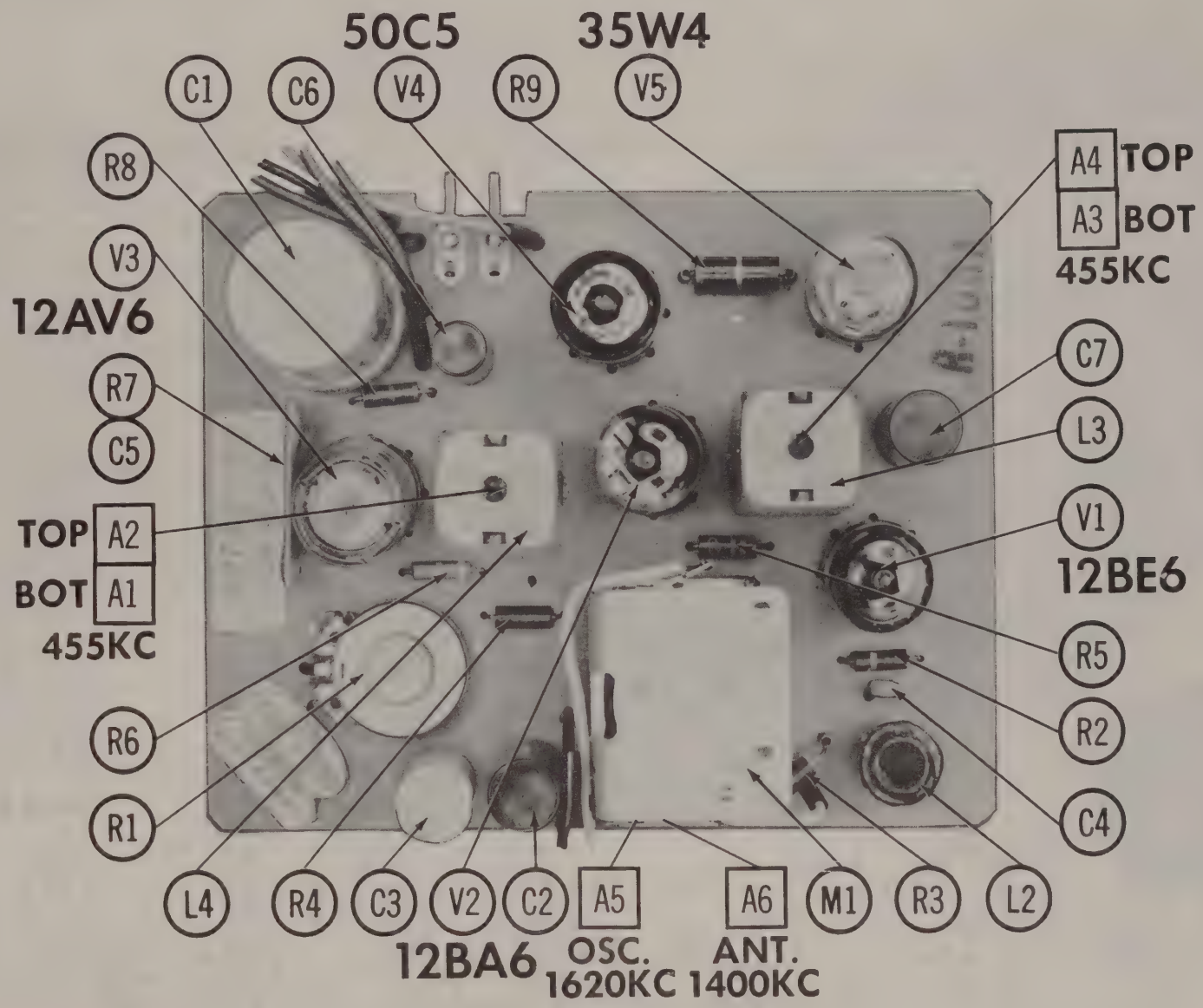
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CROSLEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3Ω		170388-3				Part of cabinet back-Note 1
L2	Osc. Coil	.6Ω	10.5Ω	159517-1				
L3	Input IF	16Ω	16Ω	170358-1				
L4	Output IF	10Ω	10Ω	170358-2				

Note 1. Part #170388-1 used in Model JC-6WE, part #170388-2 used in Model JC-6BN, part #170388-4 used in Model JC-6TN.

MISCELLANEOUS

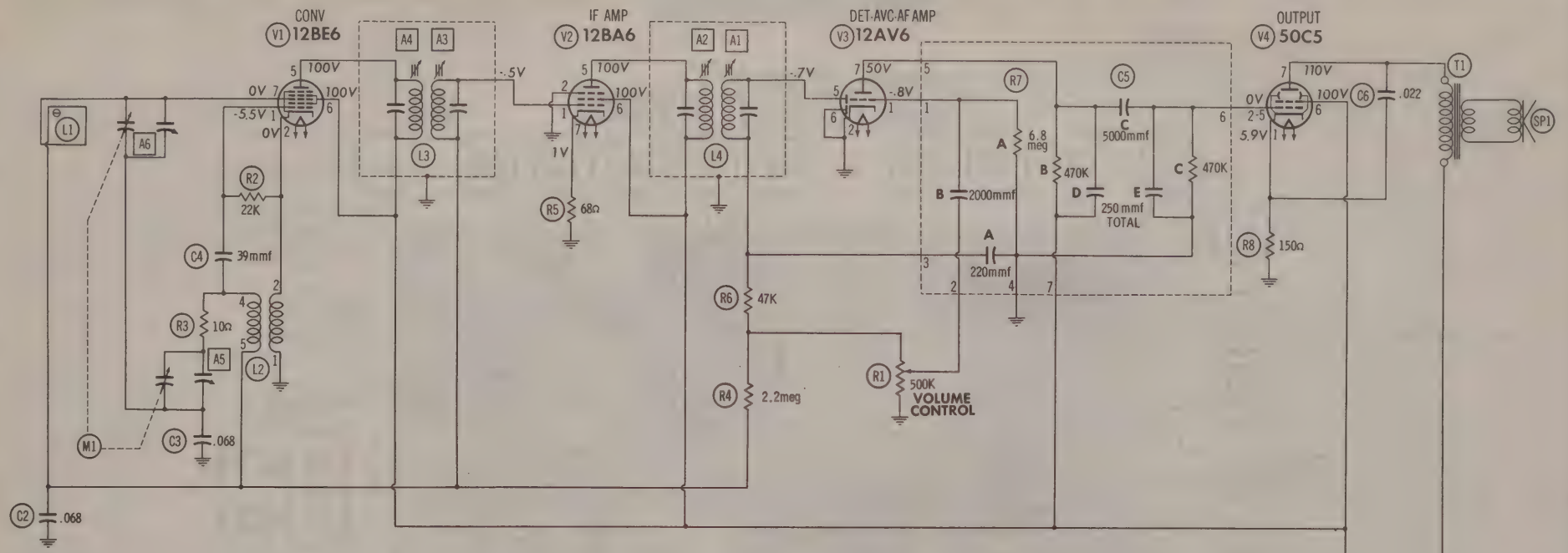
ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M1	Tuning Gang	170415-1	2 Gang (25-380MMF, 15-105MMF)
M2	Clock	170619-1	
	Cabinet	170748-1	Model JC-6WE
	Cabinet	170748-2	Model JC-6BN
	Cabinet	170748-3	Model JC-6BK
	Cabinet	170748-4	Model JC-6TN
	Knob	170766-1	Tuning - Model JC-6WE
	Knob	170766-2	Tuning - Model JC-6BN
	Knob	170766-3	Tuning - Model JC-6BK
	Knob	170766-4	Tuning - Model JC-6TN
	Knob	170761-1	Volume - Model JC-6WE
	Knob	170761-2	Volume - Model JC-6BN
	Knob	170761-3	Volume - Model JC-6BK
	Knob	170761-4	Volume - Model JC-6TN
	Knob	170767-2	Clock (2 used)



CHASSIS TOP VIEW

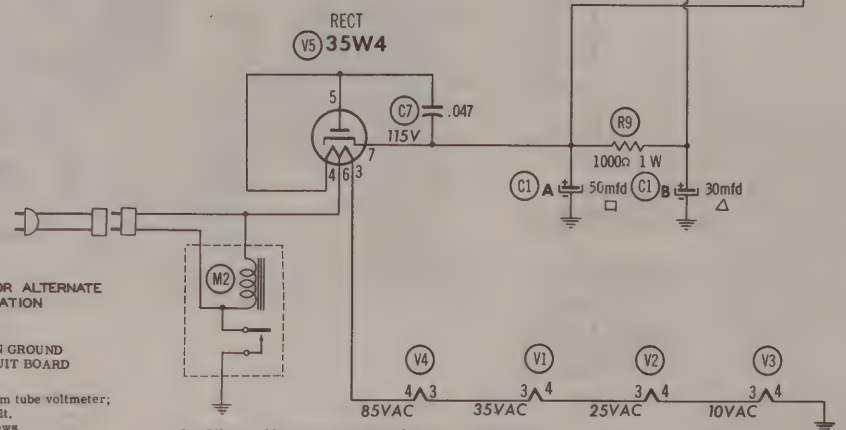
CROSLEY
MODEL 7C-6BK (Ch. R103)

SET 326 FOLDER 7



IF = 455KC

OSC. COIL
BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22KΩ	.6Ω	36Ω	24Ω	†1KΩ	†1KΩ	2.7Meg
V2	12BA6	2.7Meg	0Ω	24Ω	12Ω	†1KΩ	†1KΩ	68Ω
V3	12AV6	6.8Meg	0Ω	12Ω	0Ω	550KΩ	0Ω	†470KΩ
V4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1KΩ	200Ω
V5	35W4	NC	NC	86Ω	120Ω	120Ω	117Ω	10KΩ

ALL MEASUREMENTS TAKEN WITH CLOCK DISCONNECTED.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

⏚ DENOTES COMMON GROUND ON PRINTED CIRCUIT BOARD

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

THROUGH CAMS AND LINKAGES, ONE SW. PERFORMS ALL FUNCTIONS OF OFF, ON, AUTO, AND SLEEP

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT* Folder

PENTRON
MODEL HF-400

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PENTRON
MODEL HF-400

PENTRON
MODEL HF-400

GENERAL INFORMATION

The Pentron Model HF-400 utilizes mechanical and electrical facilities for making and playing back tape recordings. Since this unit employs the Pentron TM-56 tape transport mechanism, this service manual may be used when servicing the mechanical functions of any recorder using the TM-56 mechanism.

This recorder has two speeds (3 3/4 and 7 1/2 inches per second) and is designed for dual track recordings, giving two full length recordings on a single reel of recording tape. Any size reel up to 7" may be used on this machine. A VU Meter is used to simplify the recording level setting. Recordings can be made from a radio, television receiver or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self-contained speakers or an external speaker may be used through use of the "Ext. Spkr." jack.

Model HF-400 is designed to operate on 60 cycle, 110 to 125 volts, AC supply only. Before connecting to your line supply, be absolutely certain that it agrees with the above specifications.

MANUFACTURED by:

THE PENTRON CORPORATION
777 S. TRIPP AVENUE
CHICAGO 24, ILLINOIS

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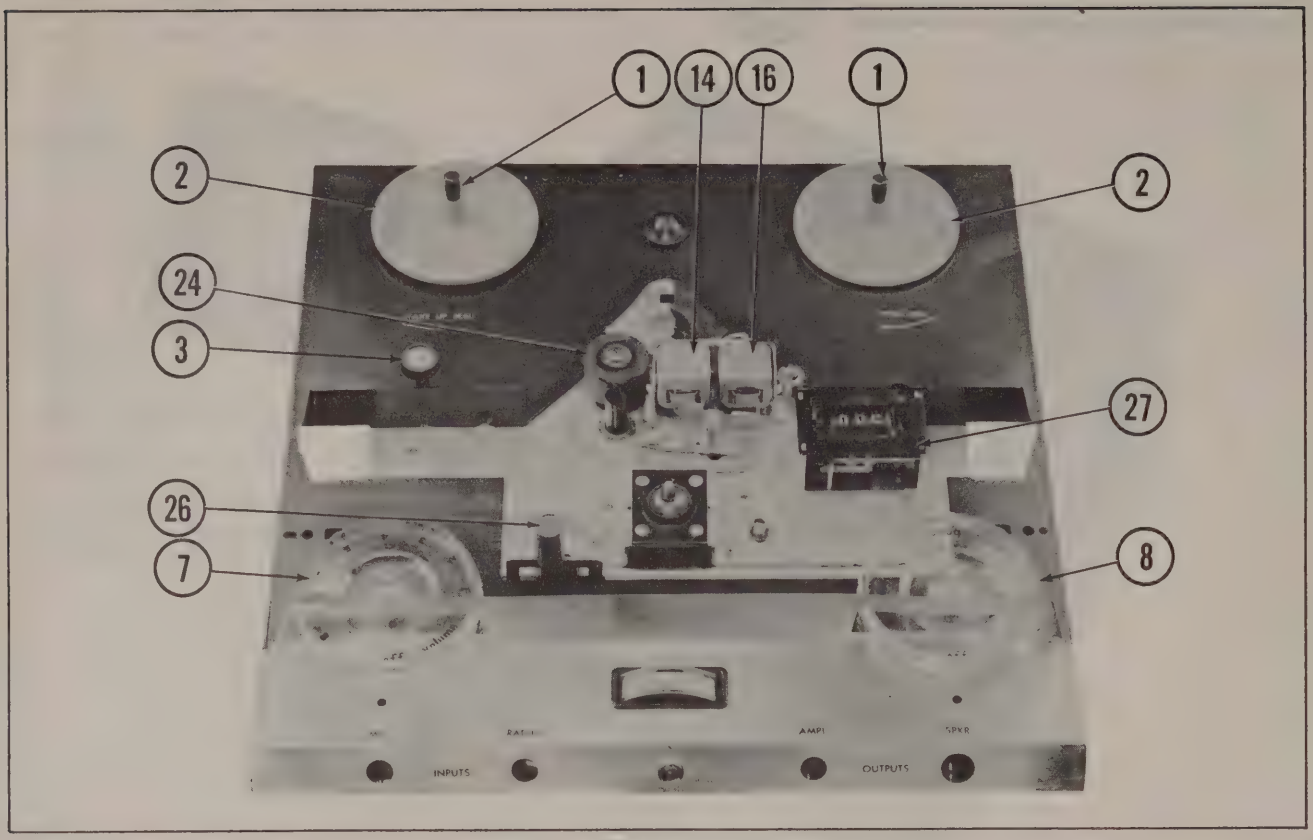

Figure 1

FUNCTIONS OF THE CONTROLS

Speed Control-

This recorder is designed to record and play back at two separate speeds, 7 1/2" per second, or 3 3/4" per second. Since quality of recording increases with the speed of the tape it is desirable to use the faster speed when recording musical programs. For voice and other types of recordings where maximum fidelity is not necessary, the slow speed is preferable since it doubles the playing time of a given size reel. To change speed, grasp the speed control shaft (3) and turn it clockwise. While holding it in the clockwise position push it down for fast speed, or pull it up for slow speed, then release.

NOTE: When recorder is not in use, the speed control should be set half-way between the two speed positions. A locator is provided for setting the control in this position.

Volume Control (Amplifier On-Off)-

The switch on this control turns on the amplifier and leaves it in stand-by position when the "Motor On-Off" switch is in the "Off" position. Turning the "Volume" control clockwise increases the volume level for both playing and recording.

Tone Control (Motor On-Off)-

This control starts and stops the mechanism drive motor. Turning the "Tone" control clockwise increases the bass response during playback. This control does not affect bass response during recording since the ideal position for recording is preset at the factory.

NOTE: Separate switches enable you to use amplifier in conjunction with radio tuner, phonograph, or P. A. System.

"Unimagic" Single Lever Control-

Play, Record, Fast Forward and Fast Rewind may be selected with this control. To play, move lever toward front of unit. For fast forward, return control to neutral (upright) and pivot it to the left. To rewind, return control to neutral, then pivot it to the right. Brakes are automatically applied when "Unimagic" control is placed in neutral position.

Record Lock Button-

When this button is down the machine is switched from a reproducer to a recorder. The recorder then erases tape passing in front of the erase head. To record, depress button at the same time "Unimagic" control is placed in the "Play" position. When the "Unimagic" control is returned to its neutral position, the record lock button is automatically disengaged.

Index Counter-

Set counter to zero at the beginning of a reel by rotating the reset knob. Counter automatically gives an accurate guide for location of recorded material anywhere on the tape.

OPERATING INSTRUCTIONS

Threading The Tape-

1. Place a reel of tape on the right hand (feed reel) spindle so that the reel will turn clockwise when tape is pulled from the reel.

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DENVER, COLORADO

NOTE: This recorder uses "A" wound tape, i.e. the dull magnetic coated side faces the center of the reel. If the tape used is type "B" (coated side facing outward) recordings will be made at a very low sound level and playback will be inaudible.

2. Place an empty reel on the left hand spindle (take-up reel). Be sure that both reels are engaged with the 3 fins on each spindle.

3. Reel out about 16" of tape and hold a section straight with both hands. Drop tape into tape slot. Thread the end of the tape into one of the slots in the outer surface of the take-up reel hub. Rotate take-up reel several turns to secure tape to reel and to take up slack between reels.

To Record From Microphone-

1. Insert the microphone plug into the "Mic." jack.

2. Turn the "Volume-On-Off" control to the "On" position. This supplies power to the amplifier.

3. Turn the "Tone-On-Off" control to the "On" position. This supplies power to the motor.

4. Before making a recording it is generally advisable to set the volume at the proper level. To do this, hold the record lock button (26) down and while talking into the microphone in a natural tone, adjust the "Volume" control so that the peaks of the meter deflection do not go past zero, or into the red area of dial calibration.

5. While holding record lock button (26) in the down position, move the "Unimagic" control (5) to the Play position. A recording is now being made and any sounds entering the microphone will be recorded on the tape.

To Record From Radio, TV, Or Phonograph-

1. Using a standard interconnecting cable such as the Pentron accessory cord X-166, fasten the two clips to the loud speaker terminals of the external source, and insert the plug on the other end into the "Radio" input on the recorder.

To Monitor A Recording-

By plugging a set of earphones in the "Ampl." jack the recording may be monitored. In an emergency the microphone will serve as an earphone if plugged into this same jack. Continued use of the microphone in this fashion is not recommended since permanent damage may result.

To Play A Recording-

1. Move the Unimagic control (5) to the "Play" position.

2. Adjust "Volume" and "Tone" controls for desired listening level.

Dual Track Recording-

This recorder is designed so that only one-half the tape width is recorded at a time, thereby resulting in dual-track recording. To make dual-track recording proceed as follows:

1. After a reel of tape has been recorded, i.e. all the tape wound onto the take-up reel, place the "Unimagic" control (5) in neutral (upright) position.

2. Remove the reels from the recorder, turn the full reel over and place it on the right-hand spindle and place the empty reel on the left-hand spindle.

3. Thread the tape and proceed with the recording.

4. After the second track has been recorded the first track is ready to be played, without rewinding, as follows:

(a) Place the full reel on the right-hand spindle and the empty reel on the left-hand spindle.

(b) Thread the tape and set the controls as described under "To Play A Recording".

FUNCTIONS OF PRINCIPAL PARTS

Unimagic Control (5)-

This control has three positions:

1. "P-R" — Play And Record Position.

When the "Unimagic" control (5) is moved into the "P-R" position, the play-record control cam (37) is actuated by the shaft in the control. This pivoting movement of cam (37) allows the pressure roller slide plate (38) to be activated by the pressure roller spring (53) which engages the pressure roller (24) with the capstan (58) which in turn drives the tape at a constant speed. The take-up adjusting lever (50) which is held against the end of slide plate (38) by the take-up spring (52), is pivoted as the slide plate moves forward. This causes the boot on take-up adjusting spring (48) to press against the equalizer bar (66) with just enough pressure for the take-up belt (78) to become taut and to rotate the take-up pulley (79) so as to wind tape on the reel. This acts as a clutch by allowing the belt to slip due to the slower speed of the capstan. Also, by the movement of slide plate (38), pressure is removed from the pressure finger lever (40), which has been engaged with the pressure pad pivot pin on the pressure pad carrier (32), which holds the pressure pads away from the heads. When pressure is removed from the pressure finger lever (40) the pressure pad spring (41) pulls the pressure pad carrier (32) inward causing pressure pads (22) to bear against the tape and hold it in positive contact with the heads.

NOTE: Mechanical functions explained above pertain to both Play and Record.

2. "R" — Rewind.

When the "Unimagic" control (5) is pivoted to the "R" position the wind-rewind slide plate (42) is activated by the shaft under the "Unimagic" control. The wind-rewind slide plate (42) in turn pushes on the tie bar (61) which bears against the equalizer bar (66) via an elastic stop nut and spacer which causes the equalizer bar (66) to pivot counter-clockwise. The pivoting of the equalizer bar makes the feed belt (60) taut which in turn drives the feed pulley (72) at a high rate of speed.

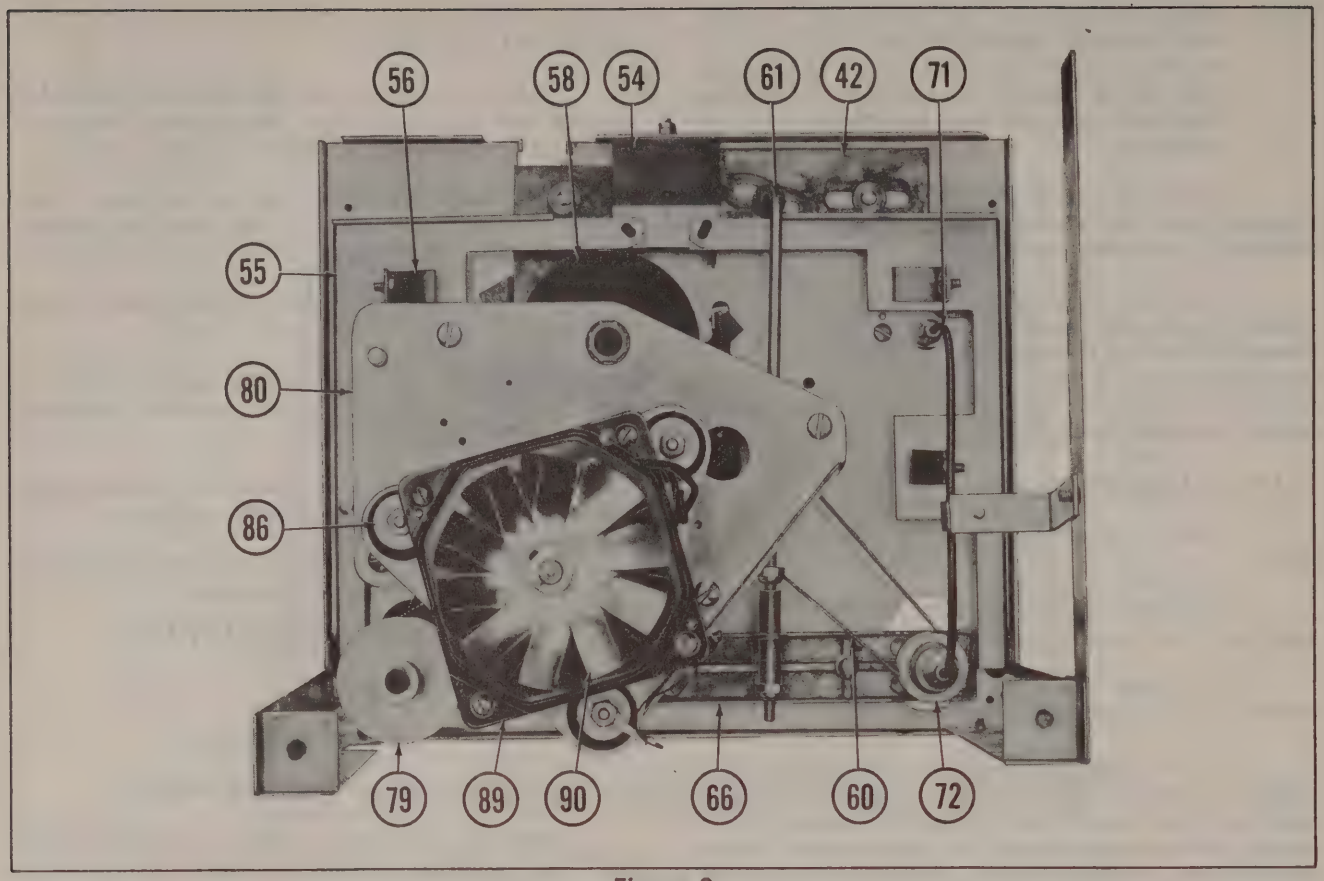


Figure 2

3. "W" (Wind) — Fast Forward.

When "Unimagic" control (5) is pivoted to the "W" position, the wind-rewind slide plate (42) is activated by the shaft under the "Unimagic" control. The wind-rewind slide plate (42) in turn pulls on tie bar (61) which bears against the equalizer bar (66) via an elastic stop nut and spacer which causes the equalizer bar to pivot clockwise. The pivoting of equalizer bar (66) makes the take-up belt (78) taut which in turn drives the take-up pulley (79) at a high rate of speed.

Brakes-

When the "Unimagic" control (5) is in the neutral (upright) position the shaft at the end of this control pushes against the control spring plate (54). The control spring plate then activates the brake arms (55) and (55A) via the brake adjustment screws (67). This action causes the brake arms to pivot, thus putting the brake lining to bear against the under side of the reel rests (2). The brake linings can be seen by removing spindle caps (1) and reel rests (2). When the "Unimagic" control is put in either Play, Rewind, or Wind position, the control spring plate (54) is released thus deactivating the brakes. When control (5) is returned to neutral from the rewind position the control spring plate (54) is pivoted counter-clockwise thus activating the left brake arm (55) before the right brake arm (55A) in order to avoid spillage of tape. When returning control (5) to neutral from the Fast Forward "W" position the control spring plate (54) is pivoted clockwise thus activating the right brake arm (55A) before the left brake arm (55) in order to avoid spillage of tape.

ADJUSTMENTS

Equalizer Bar Adjustments-

This adjustment is made by loosening socket head screw (11) and shifting equalizer bar (66) forward or backward. Make adjustments as follows:

First, remove spindle caps (1) and reel rests (2). With the "Unimagic" control (5) in the neutral (upright) position, move the equalizer bar (66) to a position such that the take-up spindle (69) is on the verge of spinning without any pressure being exerted on the equalizer bar (66) from the tie bar (61). After adjustment is made be sure socket head screw (11) is tightened securely. The equalizer bar adjustment screws (68) are adjusted by turning both screws down until they hit the mechanism plate. Then back the screws off 1/4 of a turn and lock them down with lock nuts (67). This adjustment acts as a stabilizer for the equalizer bar.

NOTE: To gain access to socket head screw (11) an aluminum cap covering the screw must be pryed off.

Tie Bar Pressure Adjustment-

The amount of pressure exerted on the equalizer bar (66), by means of the tie bar (61), is adjusted by movement of the elastic stop nuts (62). The elastic stop nuts should be adjusted so as to allow the Wind and Rewind positions on the Unimagic control to function freely and still exert enough pressure on the equalizer bar (66) for adequate Wind and Rewind performance. To determine if performance is adequate

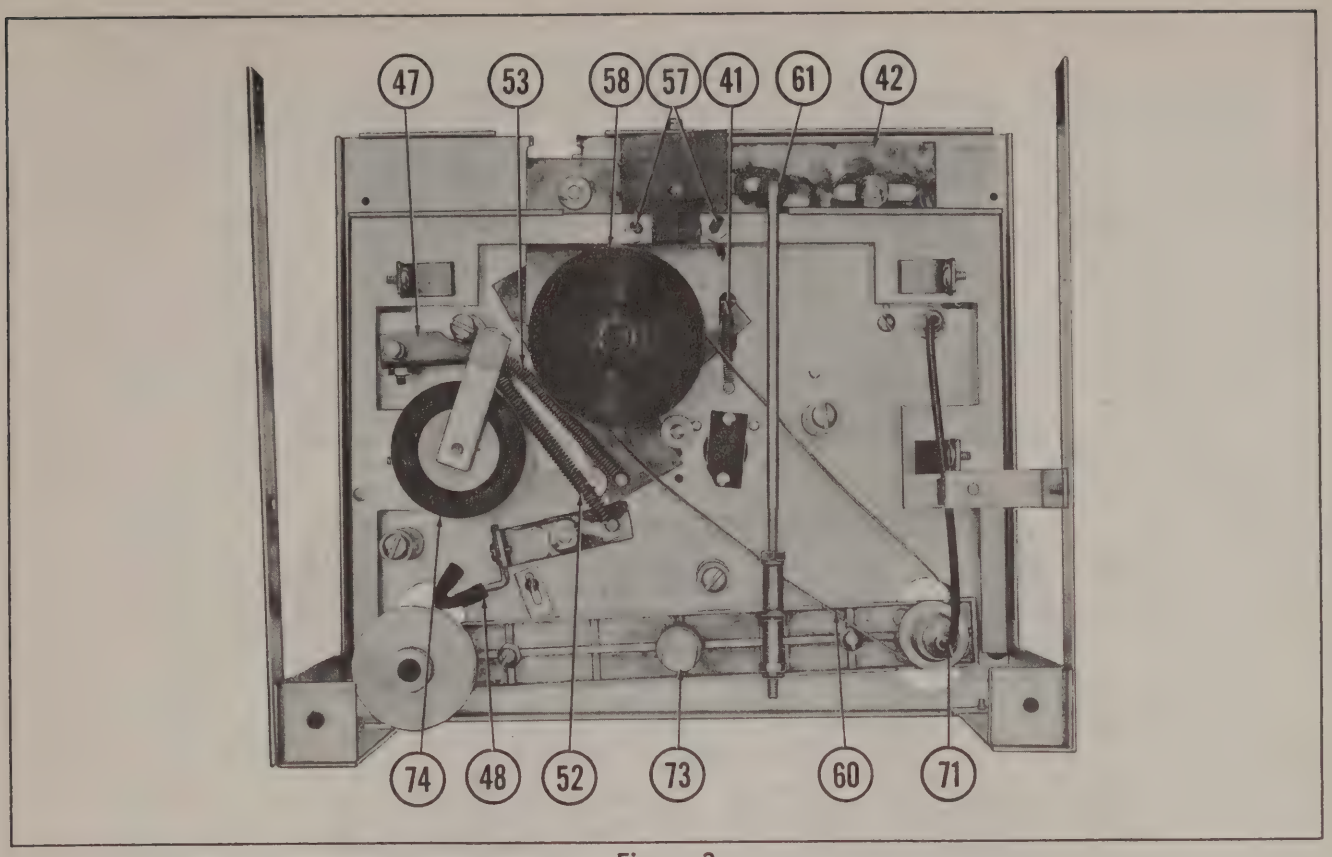


Figure 3

test the Rewind with a full 7" reel on the feed side. To test for Wind place full 7" reel on take-up side.

NOTE: The tie bar (61) must be readjusted whenever equalizer bar (66) is readjusted.

Take-Up Adjustment-

This adjustment is accomplished by bending the take-up adjusting spring (48). Bending the spring closer to the equalizer bar (66) increases pressure on the equalizer bar thus giving a stronger take-up. Bending the spring away from equalizer bar (66) gives a weaker take-up. If bending spring (48) does not give adequate adjustment, loosen the screw which mounts the spring and move the spring in the proper direction for optimum adjustment.

Brake Adjustment-

After equalizer bar adjustments have been made the brakes are ready to be adjusted. First put a full 5" reel of tape on the feed reel side, and an empty 7" reel on the take up side. Wind about 1/4 of the tape on to the 7" reel. While operating the Unimagic control from "Rewind" to "Neutral", tighten the left brake adjusting screw (57) until the reels stop in about 1 revolution without spilling tape. Next, reverse the procedure by placing the 5" reel of tape on the take-up side and the empty 7" reel on the feed side. Adjust the right brake adjusting screw (57) so that the reels stop in "Fast Forward" to "Neutral" in about 1 revolution. Next put a full 7" reel of tape on the feed side and an empty 7" reel on the take-up side. Run about 100' of tape on to the take-up reel and go directly into "Rewind". When the take-up reel is almost empty, place the Unimagic control in "Neutral". The reels should stop in about 3 or 4 revolutions without spilling tape. Next, reverse the procedure by placing the full 7" reel on the take-up side and rewind about 100' of tape on the feed reel. Go directly into "Fast Forward" until the feed reel is almost empty. Then place Unimagic control in "Neutral". The reels should stop in about 3 or 4 revolutions without spilling tape. After brakes are adjusted, check the take-up and rewind. If the take-up or rewind has been affected, readjust. If it is difficult to get adequate take-up, brakes may have been adjusted too tight. Then readjust brakes to rectify this condition.

Idler And Speed Change Adjustment-

Loosen the set screw and nut which secures idler shaft (46) to idler channel (47). Adjust position of idler channel assembly (47) so that the full perimeter of idler wheel (74) rides on the perimeter of motor pulley (76). While adjusting, position the height of idler shaft (46) so that its roll pin will locate in the slot in the shaft housing. Idler wheel (74) must be adjusted so as not to ride on the edge of the motor pulley.

Flexible Shaft Adjustment-

This adjustment is made by shifting the cable clamp support bracket to a position so that a light downward pressure is exerted of flexible shaft (71) so as to keep it from whipping when machine is in "Fast Forward" or "Rewind" position.

Play-Record Head Alignment-

To align the play-record head (14) a special head alignment wrench is necessary. An alignment tape is recommended for accurate alignment.

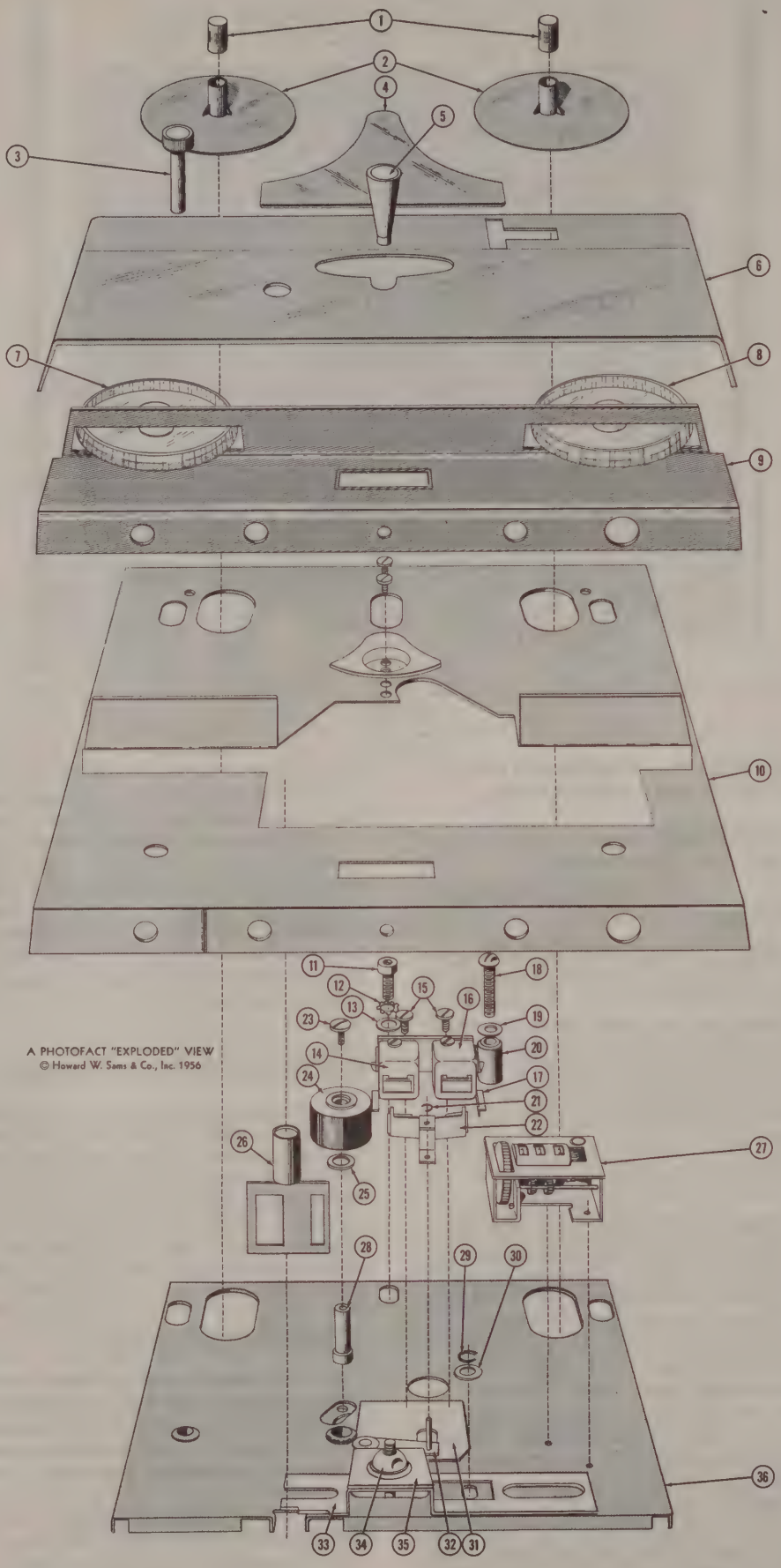


FIGURE 4A. EXPLODED VIEW OF PARTS ABOVE BASEPLATE.

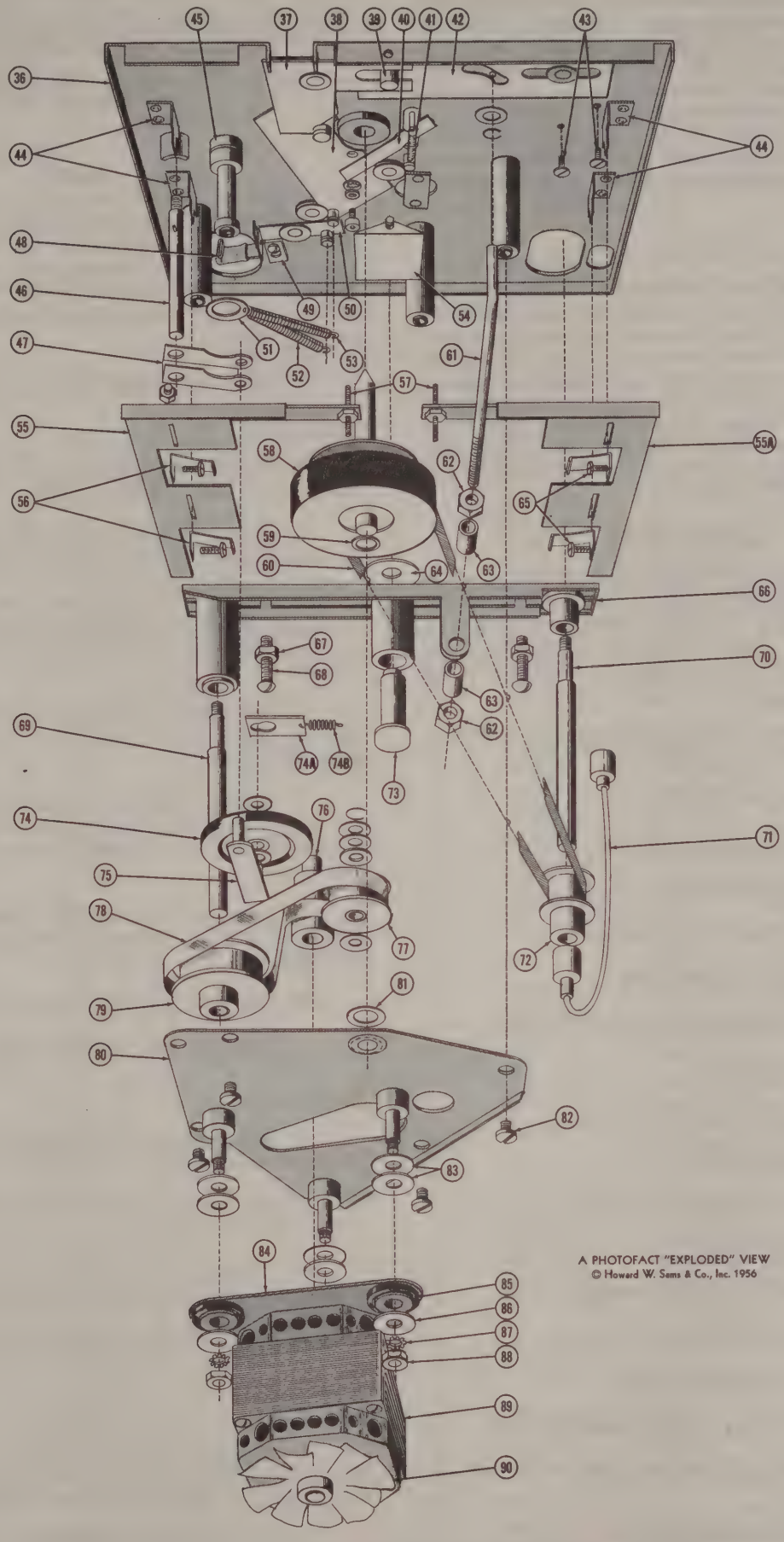


FIGURE 4B. EXPLODED VIEW OF PARTS BELOW BASEPLATE.

To align head for azimuth, slip the alignment wrench over the head can and rock head while tape is playing until maximum output is obtained. This can be readily heard because the high frequency notes will be apparent rather than the low mellow sounds. After the head is aligned it must be secured by tightening the back screw and sealing it with household cement. If the height of the head has been disturbed, the center line of the head and pole piece must be lined up so that the pole piece is at the same level as the tape guides and tape.

How To Replace A Pole Piece-

Remove the head assembly by loosening the two mounting screws which hold down the head assembly. The pole piece is then removed by inserting a non-magnetic screw driver between the head can and the pole piece and prying the pole piece loose by breaking the glue joint. The new pole piece is then inserted between the two laminations provided for each leg of the pole piece and gluing it from the sides with household cement. The head assembly is then screwed into place and the heads aligned.

LUBRICATION

Although this mechanism is prelubricated at the factory, replacement of parts require that they be lubricated in order to insure proper functioning. No part need more than a slight film of grease where grease is specified or one drop of oil where oil is specified.

The following parts require greasing with fibre grease or a similar compound:

1. Play-record cam (37).
2. Wind-rewind slide plate (42).
3. Control spring (54).
4. Control shaft (34), bottom end.
5. Slide plate assembly (38).
6. Pressure roller bearing (24) and (28).
7. Belt pulley (77).
8. Tie bar (61), front end.
9. Idler wheel bearing (74).
10. Clamp for flexible cable (71).
11. Record lock (26).
12. Equalizer bar pivot stud (66).
13. Take-up adjusting lever (50).
14. Pressure arm lever (40).
15. Pressure finger carrier assembly (32).

The following parts require oiling with 10 W lubricating oil:

1. Feed spindle assembly (70).
2. Take-up spindle assembly (69).
3. Flywheel assembly (58).

CAUTION: Do not clean oilite bearings with cleaning solvent. Oilite bearings are permanently oiled, but in some instances where the bearings appear dry a drop of oil will be necessary.

CLEANING

The play-record head (14), erase head (16), capstan (58), and pressure roller (24) are subject to an accumulation of tape coating oxide which is worn off the tape as it passes these parts. Clean these parts with a soft cloth and alcohol after every ten hours of running time.

TROUBLES AND PROBABLE REMEDIES

No Rewind-

1. Glazed idler wheel (74). Rub off slickness with a clean, dry, lint free cloth.

2. Faulty tie rod (61) adjustment. Adjust as described under "Tie Bar Pressure Adjustment".

3. Slippage of idler wheel (74) against flywheel or motor pulley. Clean idler wheel, flywheel, and motor pulley with alcohol. If idler wheel still slips, replace.

4. Idler wheel (74) not adjusted properly. Adjust as described under "Idler And Speed Change Adjustment".

5. Binding feed reel spindle (70). Loosen the set screw in rewind pulley (72). Clean bearing and spindle surface and reinstall leaving . 005 and play in assembly.

6. Dragging brake linings. Brakes not properly adjusted. Adjust brakes as described under "Brake Adjustment".

7. Bent reel rest (2). Replace reel rest.

8. Feed belt (60) loose or broken. Replace.

Flutter-

1. Motor pulley (76) not concentric to motor shaft. Replace motor and pulley assembly.

2. Excessive take-up. Adjust as described under "Take-Up Adjustment".

3. Take-up belt (78) not installed properly. Remove and replace belt as shown on Exploded View.

4. Dirty flywheel bearings. Clean bearings and flywheel shaft.

Wow-

1. Foreign matter on idler wheel (74), motor pulley (76), flywheel (58), or take-up pulley (79). Clean all wheels and pulleys with clean cloth and alcohol.

2. Defective idler wheel (74). Replace.

3. Defective pressure roller (24). Replace.

4. Reel spindles (69) and (70) binding. Loosen set screw on pulley, clean bearing and spindle surface. Reinstall leaving .005 end play in assembly.

5. Brakes improperly adjusted. Adjust as described under "Brake Adjustment".

No Wind (Fast Forward)-

1. Binding take-up spindle (69). Loosen set screw in take-up pulley (79), clean bearing and spindle surface and reinstall leaving .005 end play in assembly.

2. Take-up belt (78) loose, twisted, or broken. Replace belt.

Tape Spillage Or Insufficient Braking-

1. Faulty brake adjustment. Adjust brakes as described under "Brake Adjustment".

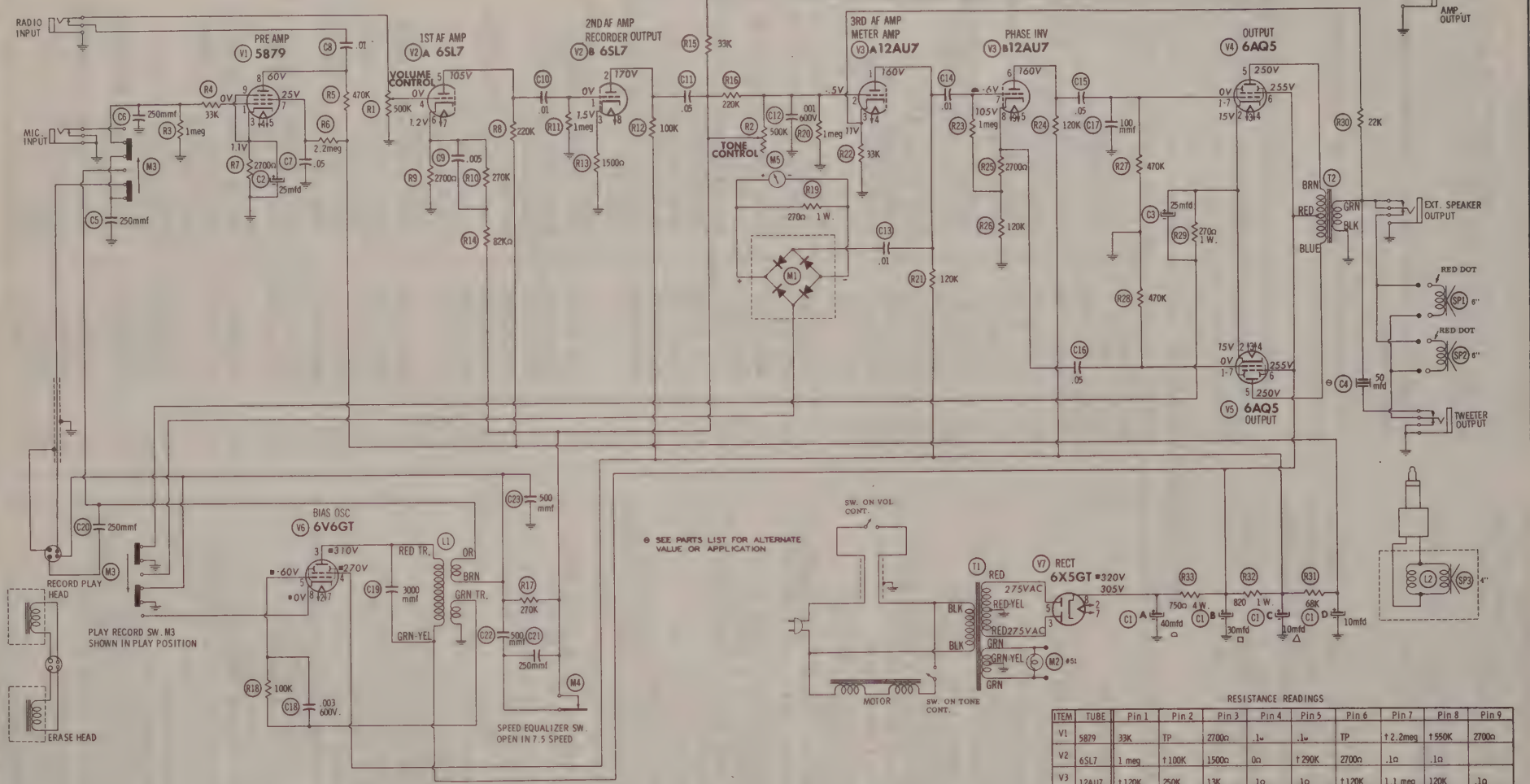
2. Worn brake linings. Replace linings and readjust brakes.

3. Worn-out or loose control spring (54). Adjust or replace control spring.

4. Excessive play in equalizer bar (66). Readjust equalizer bar as described under "Equalizer Bar Adjustments".

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	714-A-276	Reel Spindle Cap
2	765-B-12	Reel Rest
3	714-A-474	Idler Shaft Knob
4		Head Cover Casting
5	714-A-473	Control Knob, Unimagic
6		Control Plate Casting
7		Volume Control Knob
8		On-Off-Tone Control Knob
9		Front Escutcheon
10		Top Cover Panel
11	613-10896	#10-32 x 1/2" Sckt. Hd. Cap Screw
12	617-1134	#10 Ext. Tooth Lockwasher
13	616-1144	.187 x .437 x .031 Plain Washer
14	943-A-11	Record Head - Dual Track
15	611-80454	#8-32 x 1/4 B. H. M. S.
16	943-A-10	Erase Head - Dual Track
17	711-A-345	Tape Guide
18	611-11615	#10-32 x 1" Rd. Hd. Mach. Screw
19	616-1144	.187 x .437 x .031 Plain Washer
20	714-A-102	Dummy Stop
21	619-144	.125 "C" Washer
22	964-A-124	Pressure Pad & Plate Assy.
23	611-60353	#6-32 x 3/16 B. H. M. S.
24	964-A-116	Capstan Pressure Roller
25	616-A-3169	.250 x .500 x .010 Clock St'l. Washer
26		Record Lock Button
27	498-A-2	Counter
28	714-A-47	Capstan Roller Shaft
29	619-146	.188 "C" Ring
30	619-A-24	.190 x .375 x .010 Clock St'l. Washer
31	711-A-347	Shield Plate
32	964-A-114	Pressure Pad Carrier Assy.
33	711-B-134	Control Support
34	964-A-268	Control Assembly
35	711-A-592	Ball Retainer
36	711-C-137	Mechanism Plate
37	711-B-135	Play & Record Control Cam
38	964-A-23	Slide Plate Assy.
39	714-A-472	Control Shaft
40	711-A-330	Pressure Arm Lever
41	712-A-21	Pressure Pad Spring
42	711-B-133	Wind & Rewind Slide Plate
43	611-60454	#6-32 x 1/4 B. H. M. S.
44	711-A-594	Brake Support
45	714-A-161	Plate Stud
46	714-A-336	Idler Shaft
47	711-A-343	Idler Channel
48	964-A-121	Take-Up Adjusting Spring
49	711-A-209	Take-Up Stop Plate
50	964-A-129	Take-Up Adj. Lever Assy.
51	711-A-207	Spring Ring
52	712-A-5	Take-Up Pressure Spring
53	712-A-6	Pressure Roller Spring
54	742-A-23	Control Spring
55	711-C-139	Left Brake Arm
55A	711-C-140	Right Brake Arm
56	742-B-1	Brake Pivot Spring
57	613-81606	#8-32 x 1" Allen Hd. Cup Pt. Set Screw
58	714-A-471	Capstan
59	871-23	Felt Washer
60	899-A-2	Feed Belt, .312 x 17.25
61	714-B-3	Tie Bar
62	615-1124	#10-32 Elastic Stop Nut
63	714-A-182	Tie Bar Spacer
64	714-A-185	Equalizer Spacer
65	611-80454	#8-32 x 1/4 B. H. M. S.
66	964-B-19	Equalizer Bar & Bearing Assy.
67		Lock Nut
68		Equalizer Bar Adj. Screw
69	714-A-462	Take-Up Reel Spindle
70	714-A-463	Feed Reel Spindle
71	529-A-16	Flexible Shaft
72	714-A-135	Rewind Pulley
73	714-A-183	Equalizer Bar Pivot Stud
74	964-A-115	Idler Wheel
74A	711-A-346	Idler Spring Clip
74B		Idler Spring
75	964-A-139	Idler Bracket Sub Assy.
76	714-A-167	Motor Pulley
77	714-A-171	Belt Pulley
78	899-A-3	Take-Up Belt, .312 x 12.625
79	964-A-91	Take-Up Pulley
80	711-B-75	Motor Support Plate
81	616-A-9209	.377 x 5/8 x .01 Clock St'l. Washer
82	611-10554	#10-32 x 5/16 B. H. M. S.
83	711-A-341	.218 x 7/8 x 1/32 Motor Mtg. Washer
84	711-A-342	Motor Plate
85	855-A-8	Shock Mount
86	711-A-341	.218 x 7/8 x 1/32 Motor Mtg. Washer
87	617-8114	#8 Int. Tooth Lockwasher
88	614-8114	#8-32 Hex. Nut
89	367-B-6	Motor
90	717-A-20	Motor Fan



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5879	33K	TP	2700Ω	.1Ω	.1Ω	TP	†2.2meg	†550K	2700Ω
V2	6SL7	1 meg	†100K	1500Ω	0Ω	†290K	2700Ω	.1Ω	.1Ω	
V3	12AU7	†120K	250K	13K	.1Ω	.1Ω	†120K	1.1 meg	120K	.1Ω
V4	6AQ5	470K	270Ω	.1Ω	.1Ω	†1000Ω	†750Ω	470K		
V5	6AQ5	470K	270Ω	.1Ω	.1Ω	†1000Ω	†750Ω	470K		
V6	6V6GT	TP	.1Ω	†770Ω	†1.5K	100K	TP	.1Ω	■0Ω	
V7	6X5GT	TP	.1Ω	180Ω	TP	200Ω	TP	.1Ω	14K	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE NOTED.
† MEASURED FROM PIN 8 OF V7.
▲ MEASURED FROM PIN 8 OF V3.
■ MEASURED IN "RECORD" POSITION.
TP - TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	5879	
V2	1st AF Amplifier - 2nd AF Amplifier - Recorder Output	6SL7	
V3	3rd AF Amplifier - Meter Amplifier - Phase Inverter	12AU7	
V4	Audio Output	6AQ5	
V5	Audio Output	6AQ5	
V6	Bias Oscillator	6V6GT	
V7	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PENTRON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	350		AFH4-06-25	D017	FP428	TM-4029	Q-320	TVL-4673
B	■30	350			BR1235				
C	▲10	350							
D	10	350							
C2	25	25		PRS25V25	BR252	TC26	TD-25-25	FM-0225	TVA-1205
C3	25	25		PRS25V25	BR252	TC26	TD-25-25	FM-0225	TVA-1205
C4	50	25	Note 1	PRS25VNP50	BRH251 * BRH251	TC2501 * TC2501		MTH-2510 * MTH-2510	R2238 †

Note #1. Non-Polarized Electrolytic Unit.
* Connect Negative Leads Together.
† Unit Must Be Ordered From Mfgr.

FIXED CAPACITORS

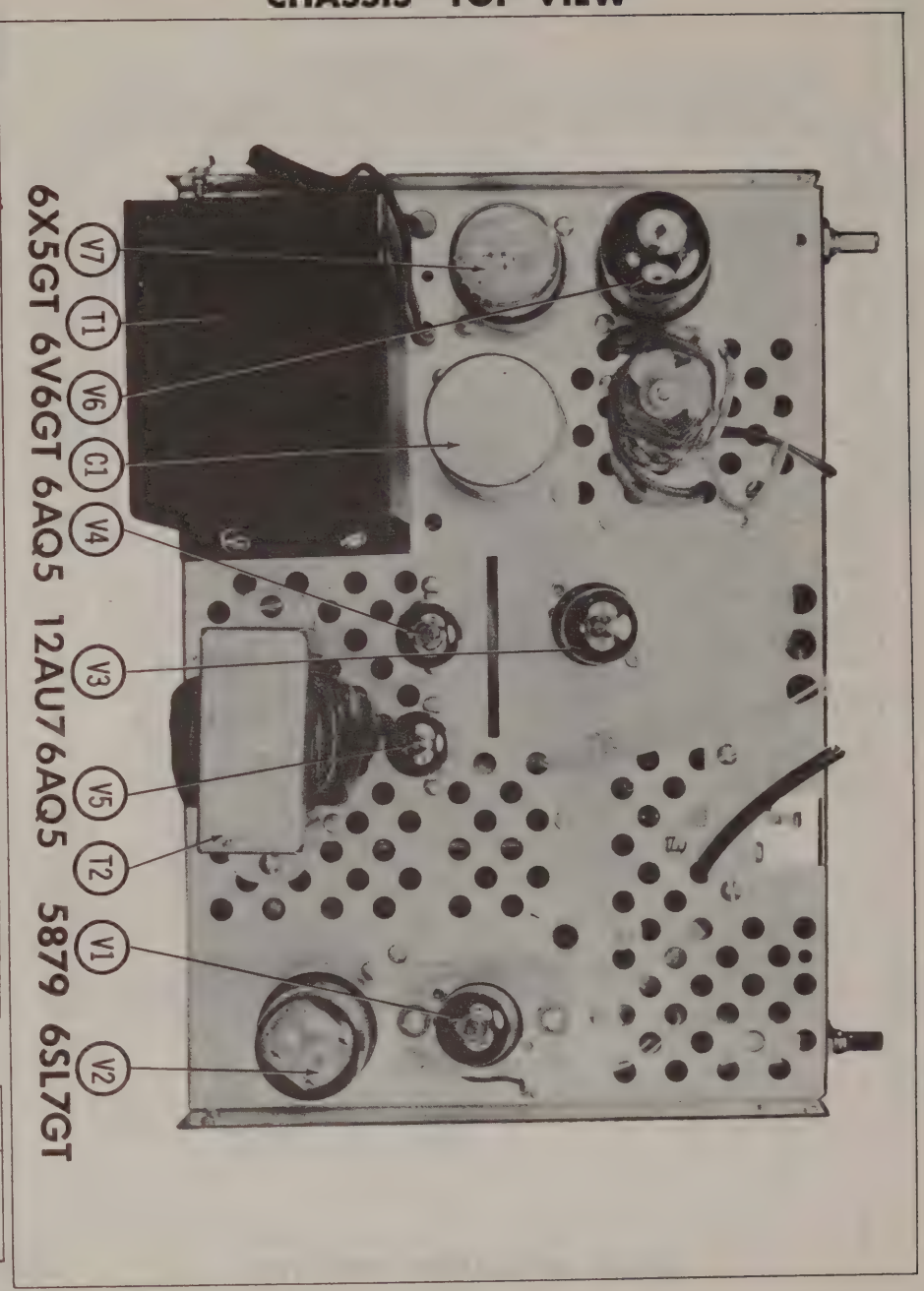
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	250			BPD-00025	DD-251	G053	811-251	UC-5325	5GA-T25	
C6	250			BPD-00025	DD-251	G053	811-251	UC-5325	5GA-T25	
C7	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C8	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C9	.005	600		SI5000	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C10	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C11	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C12	.001	600		SI1000	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C13	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C14	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C15	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C16	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C17	100	500		SI100	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C18	.003	600		SI3000	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C19	3000	500		1464-003		1R5D3		MCB461	MS-23	
C20	250			BPD-00025	DD-251	G053	811-251	UC-5325	5GA-T25	
C21	250			BPD-00025	DD-251	G053	811-251	UC-5325	5GA-T25	
C22	500			BPD-0005	DD-501	K061	811-501	UC-535	5GA-T5	
C23	500			BPD-0005	DD-501	K061	811-501	UC-535	5GA-T5	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PENTRON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	126A50413-4	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R1A
R2A	500KΩ	½	126A50413-4	B-60-S	A47-500K-Z	Q13-133	U48	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R2A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PENTRON PART No.	IRC PART No.	
R3	1Meg			BTS-1Meg	
R4	33K			BTS-33K	
R5	470KΩ			BTS-470K	
R6	2.2Meg			BTS-2.2Meg	
R7	2700Ω			BTS-2700	
R8	220KΩ			BTS-220K	
R9	2700Ω			BTS-2700	
R10	270KΩ			BTS-270K	
R11	1Meg			BTS-1Meg	
R12	100KΩ			BTS-100K	
R13	1500Ω			BTS-1500	
R14	82KΩ			BTS-82K	
R15	33KΩ			BTS-33K	
R16	220KΩ			BTS-220K	
R17	270KΩ			BTS-270K	
R18	100KΩ			BTS-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PENTRON PART No.	IRC PART No.	
R19	270Ω	1		BTA-270	
R20	1Meg			BTS-1Meg	
R21	120KΩ			BTS-120K	
R22	33KΩ			BTS-33K	
R23	1Meg			BTS-1Meg	
R24	120KΩ 5%			BTS-120K 5%	
R25	2700Ω			BTS-2700	
R26	120KΩ 5%			BTS-120K 5%	
R27	470KΩ			BTS-470K	
R28	470KΩ			BTS-470K	
R29	270Ω	1		BTA-270	
R30	22KΩ			BTS-22K	
R31	68KΩ			BTS-68K	
R32	820Ω	1		BTA-820	
R33	750Ω	4		PW4-750	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .50A	575VCT @ .068A	6.3VCT @ 2.8A		352-33					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7KΩ	3-4Ω	342-19	Z1009①	A-2901	A-3870	22S58	S-55X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PENTRON PART No.	QUAM PART No.	RCA TYPE No.	
SP1	6"	PM	3-4Ω	345-15	6A1	229S1	
SP2	6"	PM	3-4Ω	345-15	6A1	229S1	
SP3	4"	PM	3-4Ω	345-18	4A07	223S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PENTRON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Bias Osc. Coil			311-13				
L2	Speaker Shunt Coil	.2Ω		341-1				.3 Henry

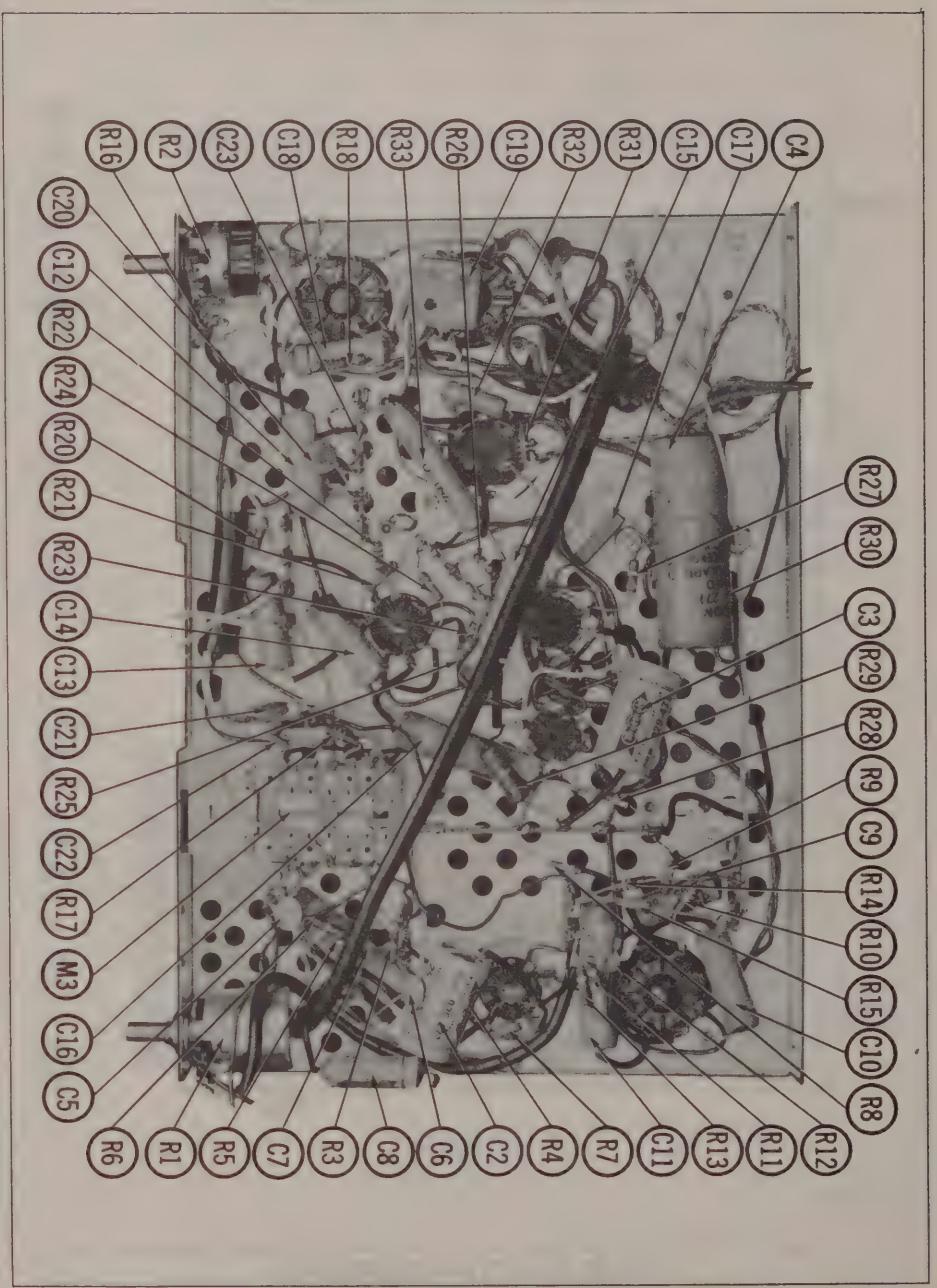
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	PENTRON PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1		026-1B1-Q	147B1B1	V1BP			026-1B1-Q	

MISCELLANEOUS

ITEM No.	PART NAME	PENTRON PART No.	NOTES
M2	Pilot Light		#51
M3	Switch	534A7	Play-Record 6PDT - Slide Type)
M4	Switch		Speed Equalizer
M5	Meter		Recording Level

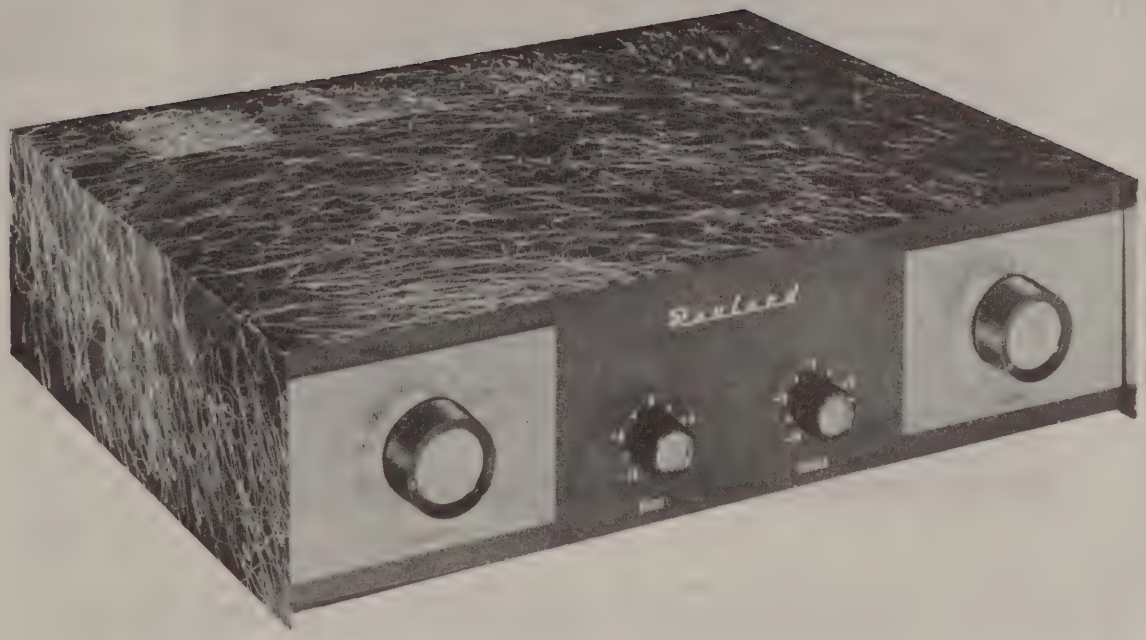
CHASSIS—BOTTOM VIEW



RAULAND MODEL 1512

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

RAULAND
MODEL 1512



RAULAND
MODEL 1512

TRADE NAME	Rauland Model 1512
MANUFACTURER	Rauland-Borg Corp., 3515 W. Addison St., Chicago 18, Illinois
TYPE SET	AC Operated Audio Amplifier
TUBES (Six)	Types 12AX7 Preamplifier, 12AX7 AF Amplifier, 12AX7 AF Amplifier-Phase Inverter, (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	117 or 130 Volts AC-60 Cycles RATING .58 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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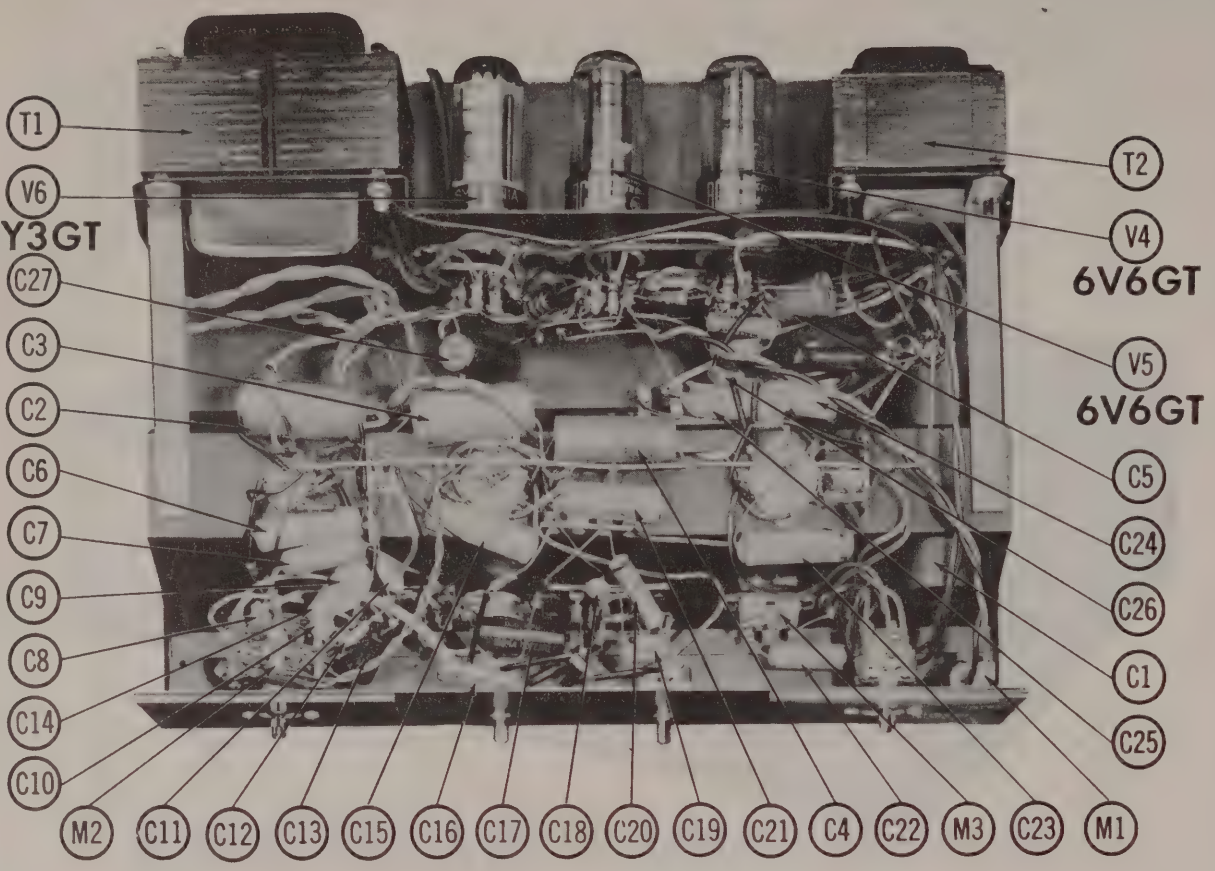
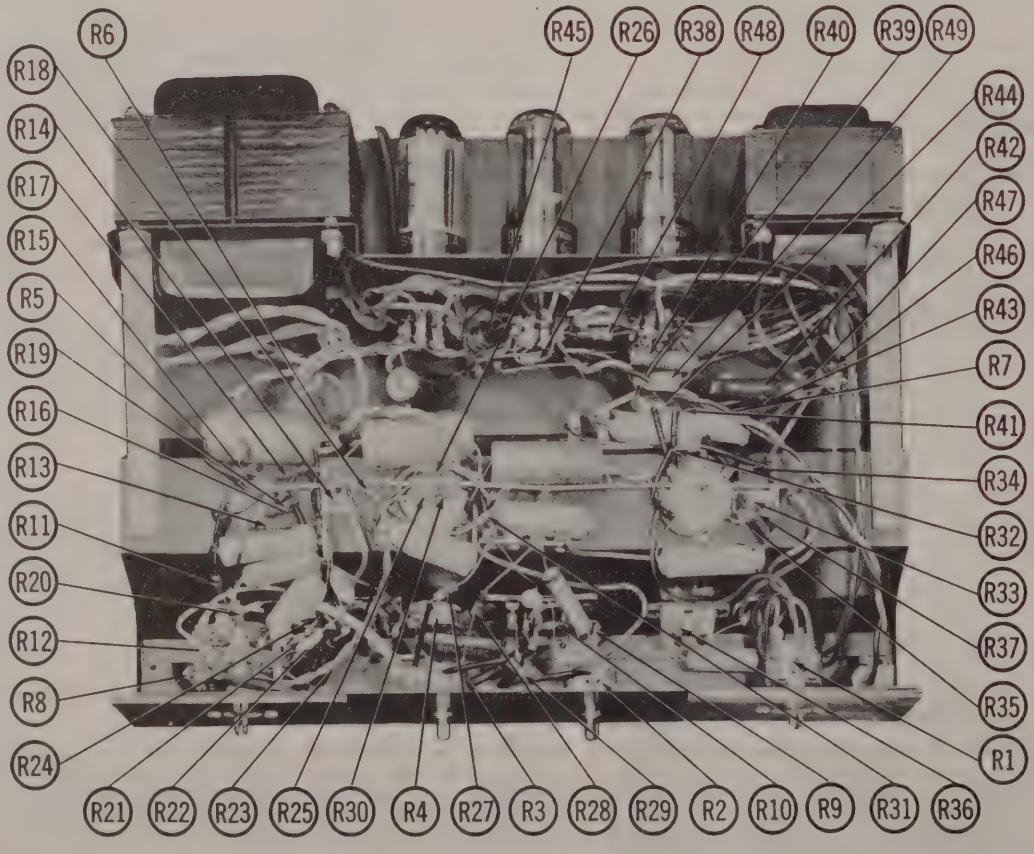
CHASSIS BOTTOM VIEW



CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	
V2	AF Amplifier	12AX7	
V3	AF Amp.-Phase Inv.	12AX7	
V4	Output	6V6GT	
V5	Output	6V6GT	
V6	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RAULAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	±40	450		APH4-17	D016	FP475.5	TMQ17	Q-055	TVL-4840
B	±10	450							
C	±10	450							
D	10	450							
C2	8	450		PRS450V8	BR845	TC71	TD-8-450	FM-4508	TVA-1704
C3	8	450		PRS450V8	BR845	TC71	TD-8-450	FM-4508	TVA-1704
C4	35	50		PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308
C5	35	50		PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

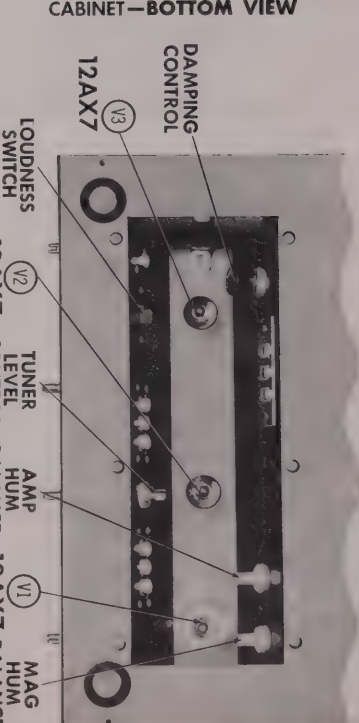
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RAULAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	.033	600		BPD-03	DF-303	CUB6833		PT6133	6TM-S33	
C7	.01	600		BPD-01	D6-103	CUB681	GP3-333-103	PT611	6TM-S1	
C8	270			DI-00027	D6-271	G056	81L-271	UC-5327	5GA-T27	
C9	4700			DI-0047	DD-5022	IW5D247	GP3-333-472	UC-5347	5GA-D47	
C10	500			DI-0005	D6-501	G060	81L-501	UC-535	5GA-T5	Note 1
C11	2200			DI-0022	D6-222	IW5D22	GP3-333-222	UC-5222	5GA-D22	
C12	1000			DI-001	D6-102	G069	81L-102	UC-531	5GA-D1	
C13	.0068	600		SI6800	D6-682	CUB6D68	81L-0068		6TM-D68	
C14	.01	600		SI10000	D6-103	CUB681	GP3-333-103	PT611	6TM-S1	
C15	.047	600		BPD-05	DF-503	CUB6847		PT6147	6TM-S47	
C16	.0056	600		SI5600	D6-562		GP3-333-562			
C17	.056	600								
C18	330			SI330	D6-331	G066	81L-331	UC-5333	5GA-T33	
C19	15	500		SI15	D6-150	SW5Q15	GP1K-150		1FM-415	
C20	.0033	600		SI3300	D6-332	CUB6D33	GP3-333-332	PT6332	6TM-D33	
C21	.047	600		BPD-05	DF-503	CUB6847		PT6147	6TM-S47	
C22	.01	600		SI10000	D6-103	CUB681	GP3-333-103	PT611	6TM-S1	
C23	.047	600		BPD-05	DF-503	CUB6847		PT6147	6TM-S47	
C24	.047	600		BPD-05	DF-503	CUB6847		PT6147	6TM-S47	
C25	.047	600		BPD-05	DF-503	CUB6847		PT6147	6TM-S47	
C26	47	500		S147	D6-470	SW5Q47	GP1K-470	MC225	1FM-447	
C27	.02	600		P689X-02		TMQ622-4P		OT-103	PX-126	

Note 1. Some versions use 560MMF in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RAULAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	RP-504AD-D	B7-S	A47F4-500K	Q18-133X	UT-429	Volume-Tapped @ 50KΩ
B	Shaft		Not Req.	Not Req.	K28-3	Not Req.	Not Req.	Attach to R1A
C	Shaft		Not Req.	Not Req.	SWK-12	76-1	US-26	Attach to R1A
R2A	500KΩ	½	RP-504AE-D	B-80	A47-500K-Z	Q13-133	U-48	Treble
B	Shaft		Not Req.	Not Req.	K28-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	RP-504AE-D	B-80	A47-500K-Z	Q13-133	U-46	Bass
B	Shaft		Not Req.	Not Req.	K28-3	Not Req.	Not Req.	Attach to R3A
R4A	500KΩ	½	RP-504AE-D	B-80	A47-500K-Z	Q13-133	U-46	Tuner level
B	Shaft		Not Req.	Not Req.	K28-3	Not Req.	Not req.	Attach to R4A
R5	200Ω	1	RPW-201F	WPK-200				Mag. Bum Balance - wire wound
R6	200Ω	1	RPW-201F	WPK-200				Amp. Bum Balance - wire wound
R7	500Ω	½	RP-501D	B-4-S				Damping & switch

CABINET—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RAULAND PART No.	IRC PART No.	
R8	470KΩ			BTS-470K	
R9	27KΩ			BTS-27K	
R10	22KΩ			BTS-22K	
R11	100KΩ			BTS-100K	
R12	150KΩ			BTS-150K	
R13	220KΩ 1%			DCC½-220K	
R14	22KΩ			BTS-22K	
R15	1500Ω 1%			DCC½-1500	
R16	470KΩ			BTS-470K	
R17	47KΩ 1%			DCC½-47K	
R18	22KΩ			BTS-22K	
R19	1500Ω 1%			DCC½-1500	
R20	68KΩ			BTS-68K	
R21	68KΩ			BTS-68K	
R22	68KΩ			BTS-68K	
R23	68KΩ			BTS-68K	
R24	100KΩ			BTS-100K	
R25	3.3Meg			BTS-3.3Meg	
R26	22KΩ			BTS-22K	
R27	47KΩ			BTS-47K	
R28	4700Ω			BTS-4700	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RAULAND PART No.	IRC PART No.	
R29	47KΩ			BTS-47K	
R30	220KΩ			BTS-220K	
R31	1500Ω			BTS-1500	
R32	270KΩ			BTS-270K	
R33	470KΩ			BTS-470K	
R34	47KΩ			BTS-47K	
R35	680Ω			BTS-680	
R36	22KΩ			BTS-22K	
R37	47KΩ			BTS-47K	
R38	470KΩ			BTS-470K	
R39	470KΩ			BTS-470K	
R40	350Ω	4			
R41	3000Ω 5%			BTS-3000 5%	
R42	3Ω 5%	10		PW10-3 5%	
R43	47Ω 5%			BTS-47 5%	
R44	270Ω 5%	1		BTA-270 5%	
R45	2200Ω	2		BTB-2200	
R46	4700Ω			BTS-4700	
R47	4700Ω			BTS-4700	
R48	4.7Ω			BW½-4.7	
R49	1000Ω	1		BTA-1000	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	RAULAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	130VAC Tap @ 117VAC @.58A	655VCT .077A	5VAC @2A	10.4VAC @.195A SEC. 4 6.5VAC @1.7A	LP-0248					

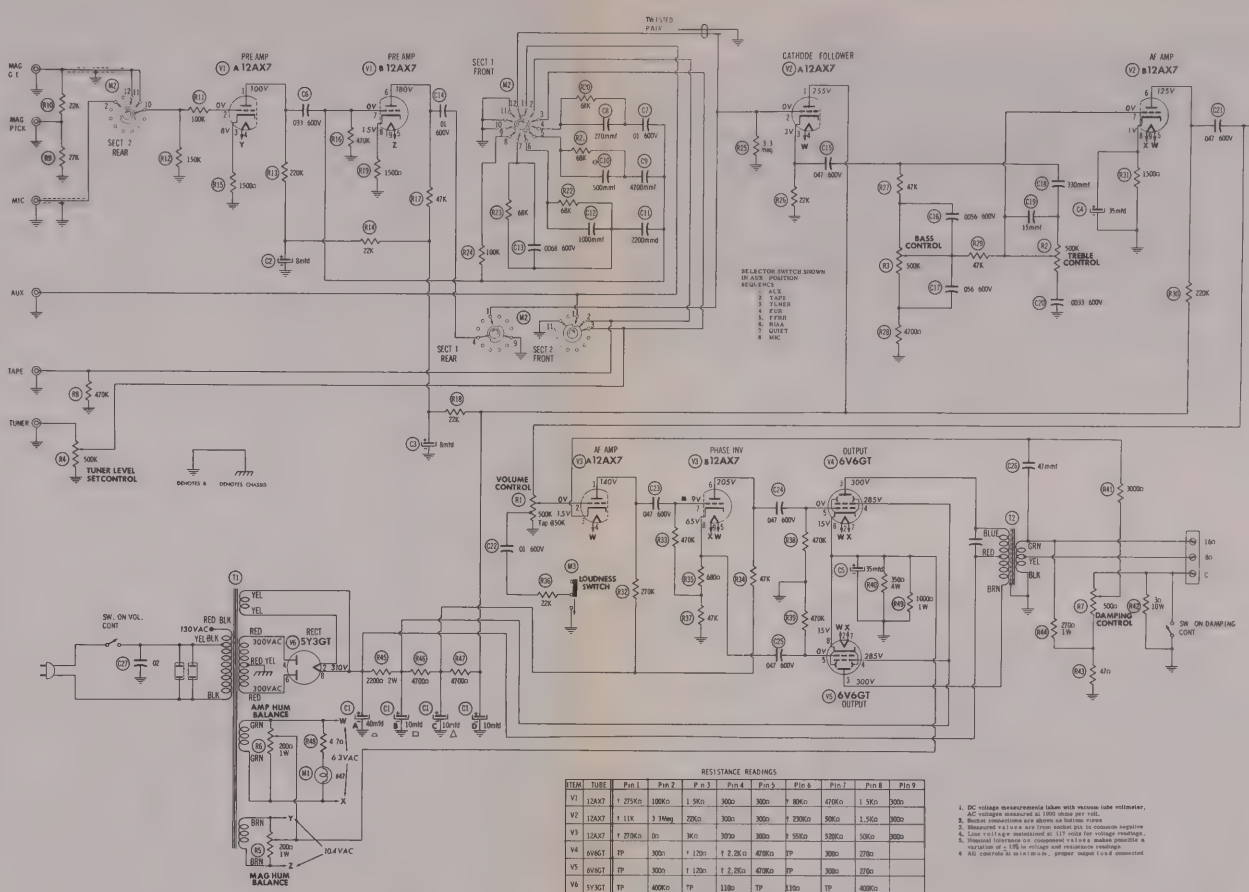
TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI	SEC	RAULAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No	Thordarson PART No.	Triad PART No	
T2	7.6KΩ	16Ω tap @ 8Ω	LO-0136-H						

MISCELLANEOUS

ITEM No.	PART NAME	RAULAND PART No.	NOTES
M1	Pilot Light		#47
M2	Switch		Selector & record compensation (Rotary, wafer type)
M3	Switch		Loudness (SPDT-Slide type)

PARTS LIST AND DESCRIPTIONS (Continued)



SELECTOR SWITCH SHOWN IN AUX POSITION

1. TAPE
2. AUX
3. TUNER
4. PUR
5. RIAA
6. QUIET
8. MIC

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑ 275KΩ	100KΩ	1.5KΩ	300Ω	300Ω	↑ 80KΩ	470KΩ	1.5KΩ	300Ω
V2	12AX7	↑ 11K	3.3Meg	22KΩ	300Ω	300Ω	↑ 230KΩ	50KΩ	1.5KΩ	300Ω
V3	12AX7	↑ 270KΩ	0Ω	1KΩ	300Ω	300Ω	↑ 55KΩ	520KΩ	50KΩ	300Ω
V4	6V6GT	TP	300Ω	↑ 120Ω	↑ 2.2KΩ	470KΩ	TP	300Ω	270Ω	
V5	6V6GT	TP	300Ω	↑ 120Ω	↑ 2.2KΩ	470KΩ	TP	300Ω	270Ω	
V6	5Y3GT	TP	400KΩ	TP	110Ω	TP	110Ω	TP	400KΩ	

ALL MEASUREMENTS TAKEN WITH SELECTOR SWITCH IN "MIC" POSITION.
↑ MEASURED FROM PIN 8 OF V6
■ MEASURED FROM PIN 8 OF V3
TP - TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected

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RAYTHEON MODEL UC-2185M

TRADE NAME	Raytheon Models UC-2185B, UC-2185M (Ch. 21T39)
MANUFACTURER	Raytheon Manufacturing Co., Television & Radio Div., 5921 W. Dickens Ave., Chicago 39, Illinois
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	105-115 Volts AC-60 Cycle RATING 1.4 Amp. @ 115 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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RAYTHEON MODELS
UC-2185B, M (Ch. 21T39)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type control knobs from front panel of cabinet.

2. Remove 13 metal screws. Remove rear cover.

3. Remove picture tube socket, HV lead, yoke leads and speaker leads.

4. Remove 4 metal screws securing front grille plate and remove 2 metal screws now exposed by removal of grille plate.

5. Remove 2 metal screws holding antenna-interlock bracket.

6. Remove 2 chassis mounting bracket screws securing bracket to side of cabinet.

7. Remove chassis from cabinet.

8. Remove 4 wood screws holding speaker. Remove speaker from cabinet.

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MODELS	CHASSIS
UC-2185B, UC-2185M	21T39

RAYTHEON MODELS
UC-2185B, M (Ch. 21T39)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the left of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws holding wood molding at the top edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the chassis. Adjustment is located on top of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (L29) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control located on top of chassis for maximum sound and MINIMUM buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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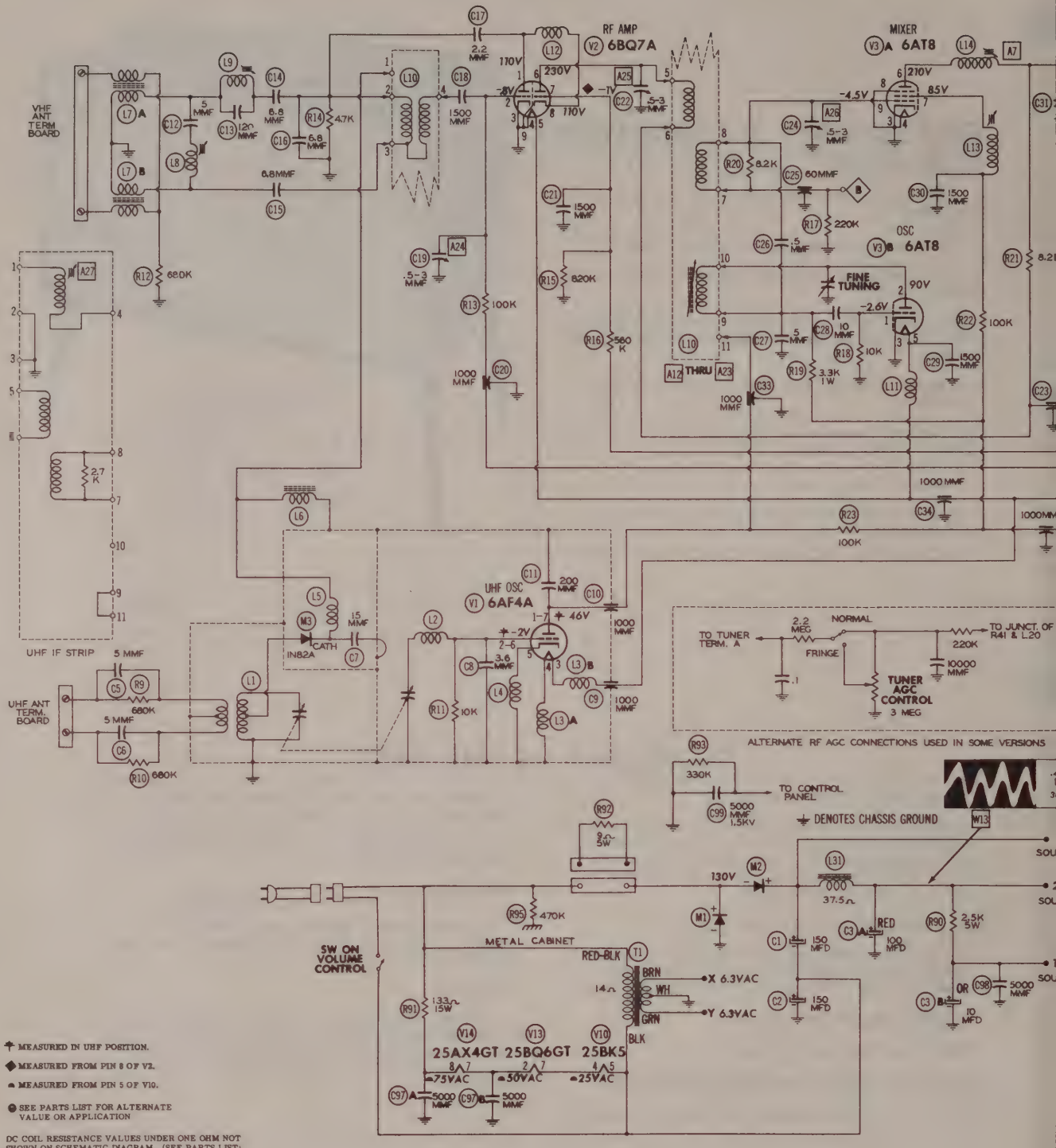

✝ MEASURED IN UHF POSITION.

◆ MEASURED FROM PIN 8 OF V2.

◓ MEASURED FROM PIN 5 OF V10.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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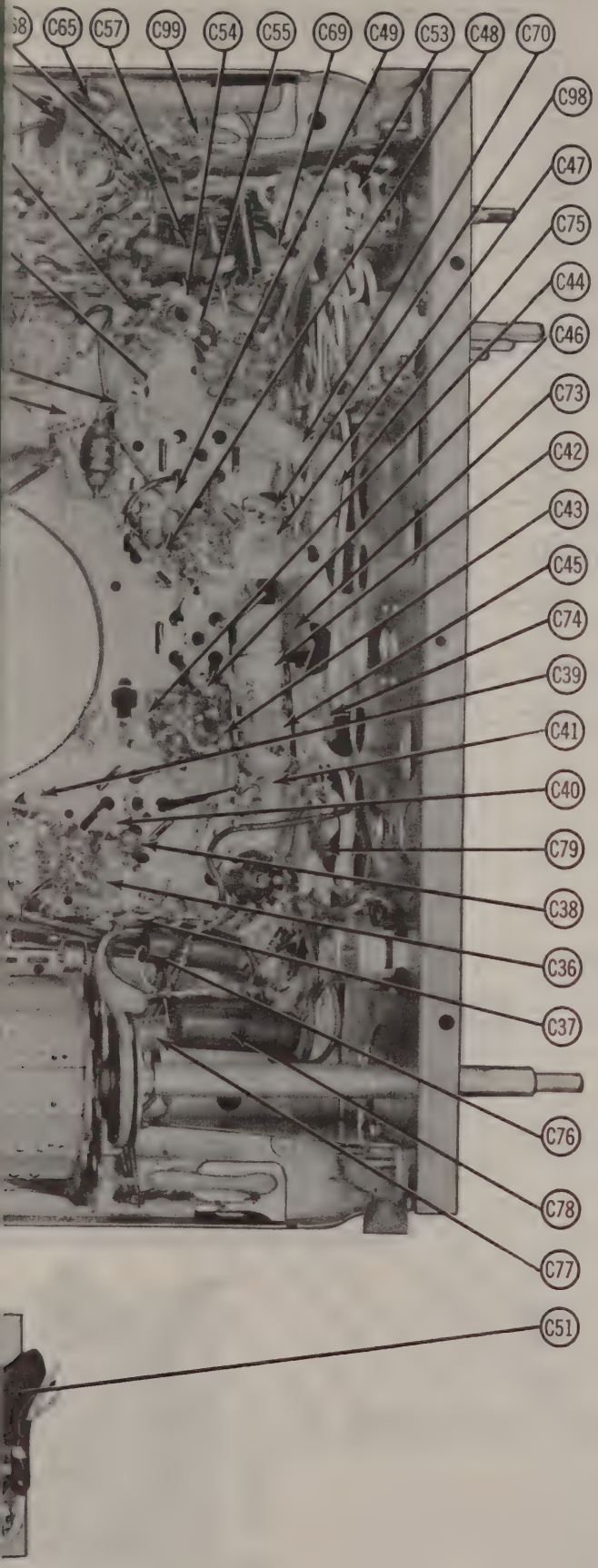

AND ALIGNMENT IDENTIFICATION

CHASSIS BOTTOM VIEW-RESISTO

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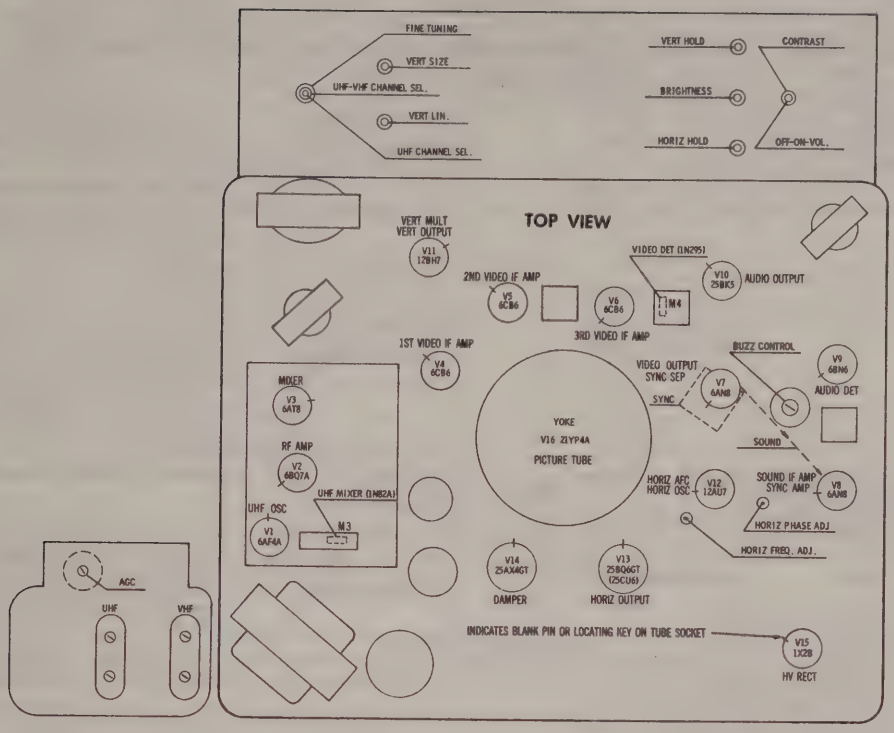
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

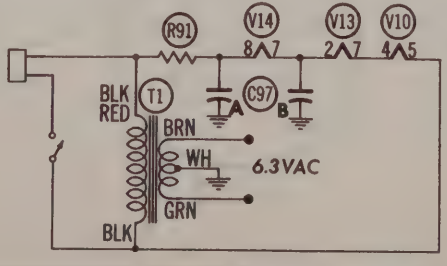
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V7, V16
Has pic, no sound - V8, V9, V10

SYNC FAILURE
No vert. sync - V8, V11
No horiz. sync - V8, V12
No vert. or horiz. sync - V7, V8

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V16
No vertical deflection - V11
Poor vert. linearity or foldover - V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V15, M1, M2
Vert. off freq. - V8, V11
Horiz. off freq. - V8, V12

NOTE: Since this receiver employs tubes used in a series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative (See circuit below).



SET 326 FOLDER 10

RAYTHEON MODELS
UC-2185B, M (Ch. 21T39)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped away from the chassis.

VIDEO IF ALIGNMENT

Connect a .001MFD capacitor across the vertical amplifier terminals of the oscilloscope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizonal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	Not used	44.3MC (Unmod)	10	Use VTVM. DC probe to point (A). Common to chassis.	A1	Attenuate signal generator to maintain not more than 2 volts at VTVM. Adjust for maximum deflection.
2.	"	"	"	47.25MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	"	45.4MC	"	"	A3	Attenuate signal generator to maintain not more than 2 volts at VTVM. Adjust for maximum deflection.
4.	"	"	"	43.0MC	"	"	A4	"
5.	"	"	43.5MC (10MC Swp)	42.5MC 45.6MC	"	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Use only enough sweep generator output to provide usable pattern on scope. Check for response curve similar to Fig. 1. If necessary retouch A1, A3 and A4 for desired response. Adjust A1 for MINIMUM tilt. A3 affects high frequency side of response curve. A4 affects low frequency side of curve.
6.	Direct	High side to ungrounded tube shield floating over converter tube. Low side to chassis.	Not used	41.25MC	"	USE VTVM. DC probe to point (A). Common to chassis.	A5	Adjust for MINIMUM deflection.
7.	"	"	43.5MC (10MC Swp)	42.5MC 45.6MC	"	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A6, A7	Adjust A6 and A7 for response similar to Fig. 2. If necessary, slightly retouch A1 for MINIMUM tilt, A3 for position of 45.6MC marker and A4 for position of 42.5MC marker.

SOUND IF ALIGNMENT

Restore the receiver to normal operating condition. Tune in a TV signal and adjust the fine tuning control until sound bars just appear in the picture. Adjust A8 slug counter clockwise from the coil turns. Then clockwise until the scanning lines are smooth and continuous. Readjust the fine tuning for the clearest picture and best sound.
Insert an attenuator in series with the antenna and the receiver antenna terminals so that the signal strength may be varies from weak to strong. If a suitable attenuator is not available, stray feed the signal to the receiver by placing the antenna lead-in near the antenna terminals. Reduce the signal input to the receiver so that the signal falls below the limiting level of the 6BN6 as evidenced by a hiss in the sound. Adjust the secondary of the sound take-off transformer (A9), the sound IF transformer (A10), the quadrature coil (A11) and the buzz control (R7) for maximum sound and minimum buzz. If the hiss disappears while adjusting, increase attenuation until hiss reappears.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 1.5 volt bias battery to the tuner AGC. Connect the positive lead to chassis.
The channel oscillator adjustment screws are reached thru a hole just to the left of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

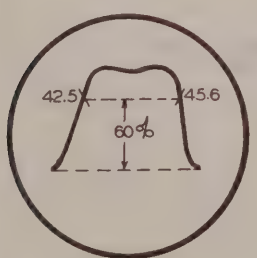


FIG.1

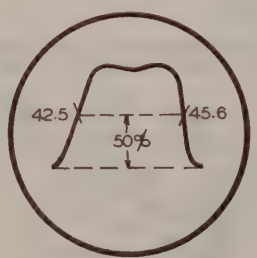


FIG. 2

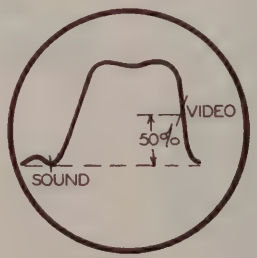


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT

Connect the bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A24, A25, A26	Adjust for response curve similar to Fig. 4 with markers above 90%.
11.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 4. If markers fall below 70% on any channel, make compromise adjustments of A24, A25 and A26 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	600MC (10MC Swp)		35	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A27	Use only enough sweep generator output to provide usable pattern on scope. Adjust A27 for response similar to Fig. 5.
13.	"	"	470MC		14	"		Response curve should have tilt similar to Fig. 6.
14.	"	"	870MC		80	"		Response curve tilt should be similar to Fig. 7. Tilts on response curves in steps 12 and 13 should be approximately equal. If not, retouch A27 until they are equal.

FIG.4

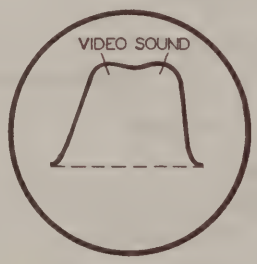


FIG.5

FIG.6

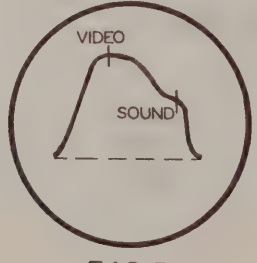
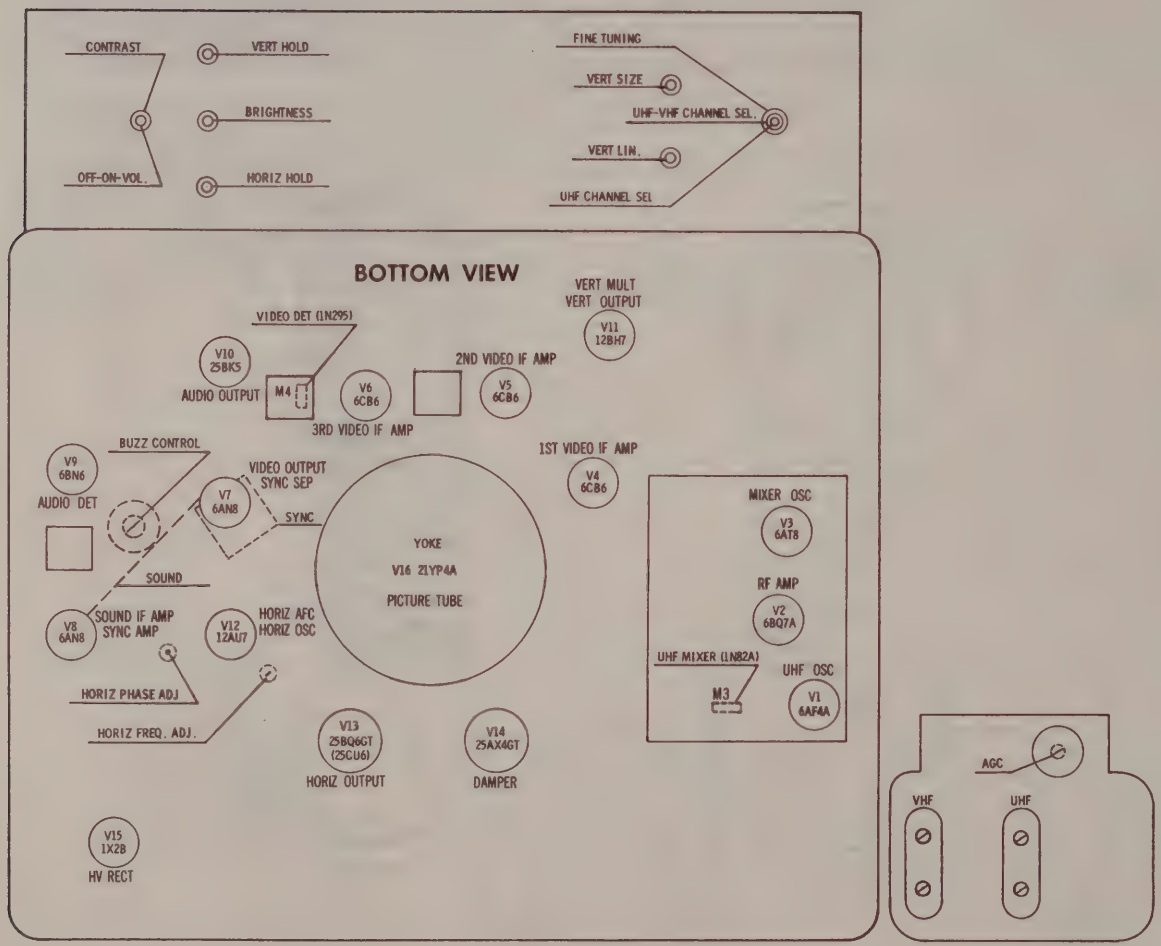


FIG.7

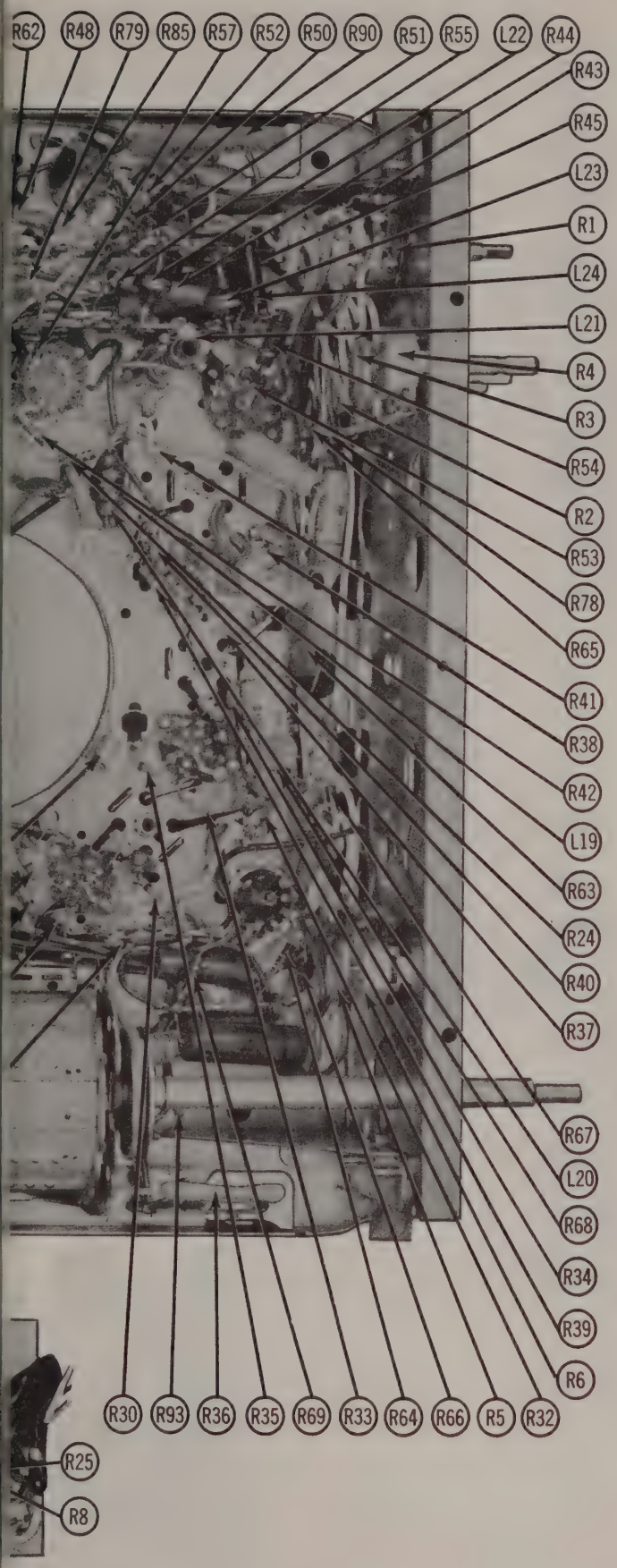
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4A	*† 6.8KΩ	10KΩ	.1Ω	0Ω	0Ω	10KΩ	*† 6.8KΩ		
V 2	6BQ7A	INF	2.5Meg	0Ω	0Ω	.1Ω	† 1KΩ	300KΩ	INF	0Ω
V 3	6AT8	10KΩ	† 6.8KΩ	0Ω	0Ω	.1Ω	† 8.3KΩ	† 100KΩ	0Ω	220KΩ
V 4	6CB6	1Meg	47Ω	0Ω	.1Ω	† 3.7KΩ	† 3.7KΩ	0Ω		
V 5	6CB6	1Meg	47Ω	0Ω	.1Ω	† 3.7KΩ	† 3.7KΩ	0Ω		
V 6	6CB6	.1Ω	150Ω	0Ω	.1Ω	† 3.5KΩ	† 3.5KΩ	0Ω		
V 7	6AN8	† 100KΩ	2.2Meg	0Ω	0Ω	.1Ω	† 5.6KΩ	† 3.5KΩ	1Meg	120Ω
V 8	6AN8	† 8.2KΩ	22KΩ	0Ω	0Ω	.1Ω	† 33KΩ	† 33KΩ	470KΩ	47Ω
V 9	6BN6	350Ω	.4Ω	0Ω	.1Ω	† 18KΩ	5.3Ω	† 220KΩ		
V 10	25BK5	† 486Ω	TP	500KΩ	# 10Ω	# 0Ω	150Ω	500KΩ	† 38Ω	TP
V 11	12BH7	▲ 4KΩ	2.2Meg	1.2KΩ	.1Ω	.1Ω	▲ 5Meg	100KΩ	100KΩ	1.5Ω
V 12	12AU7	† 50KΩ	300KΩ	0Ω	0Ω	0Ω	† 30KΩ	1.5Meg	280KΩ	.1Ω
V 13	25BQ8GT	TP	# 20Ω	TP	† 8.2KΩ	470KΩ	TP	# 10Ω	0Ω	TOP CAP ▲ 13Ω
V 14	25AX4GT	TP	NC	100KΩ	NC	† 38Ω	TP	# 20Ω	# 30Ω	
V 15	1X2B		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 253Ω
V 16	21YP4A	0Ω	33KΩ	PIN 6 † 38Ω	PIN 10 † 38Ω	PIN 11 † 150KΩ	PIN 12 .1Ω			

* MEASURED IN "UHF" POSITION.
† MEASURED FROM OUTPUT OF M2.
▲ MEASURED FROM PIN 3 OF V14.
MEASURED FROM PIN 5 OF V10.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART



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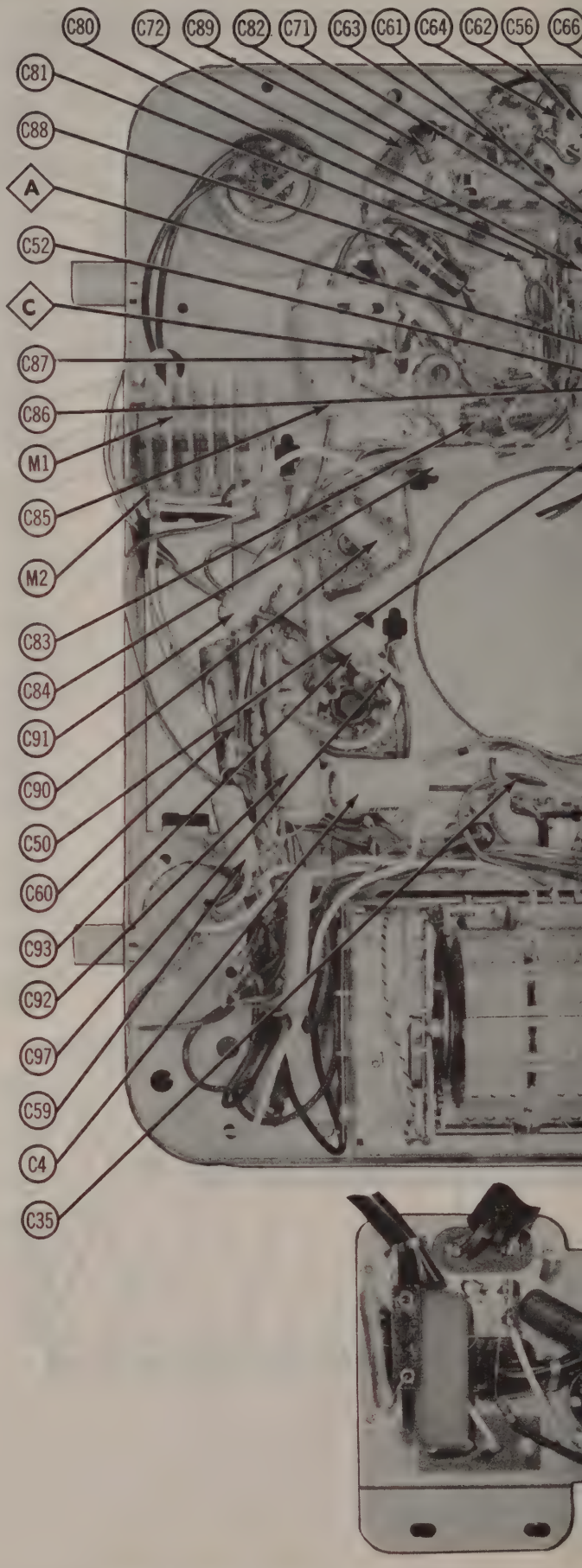
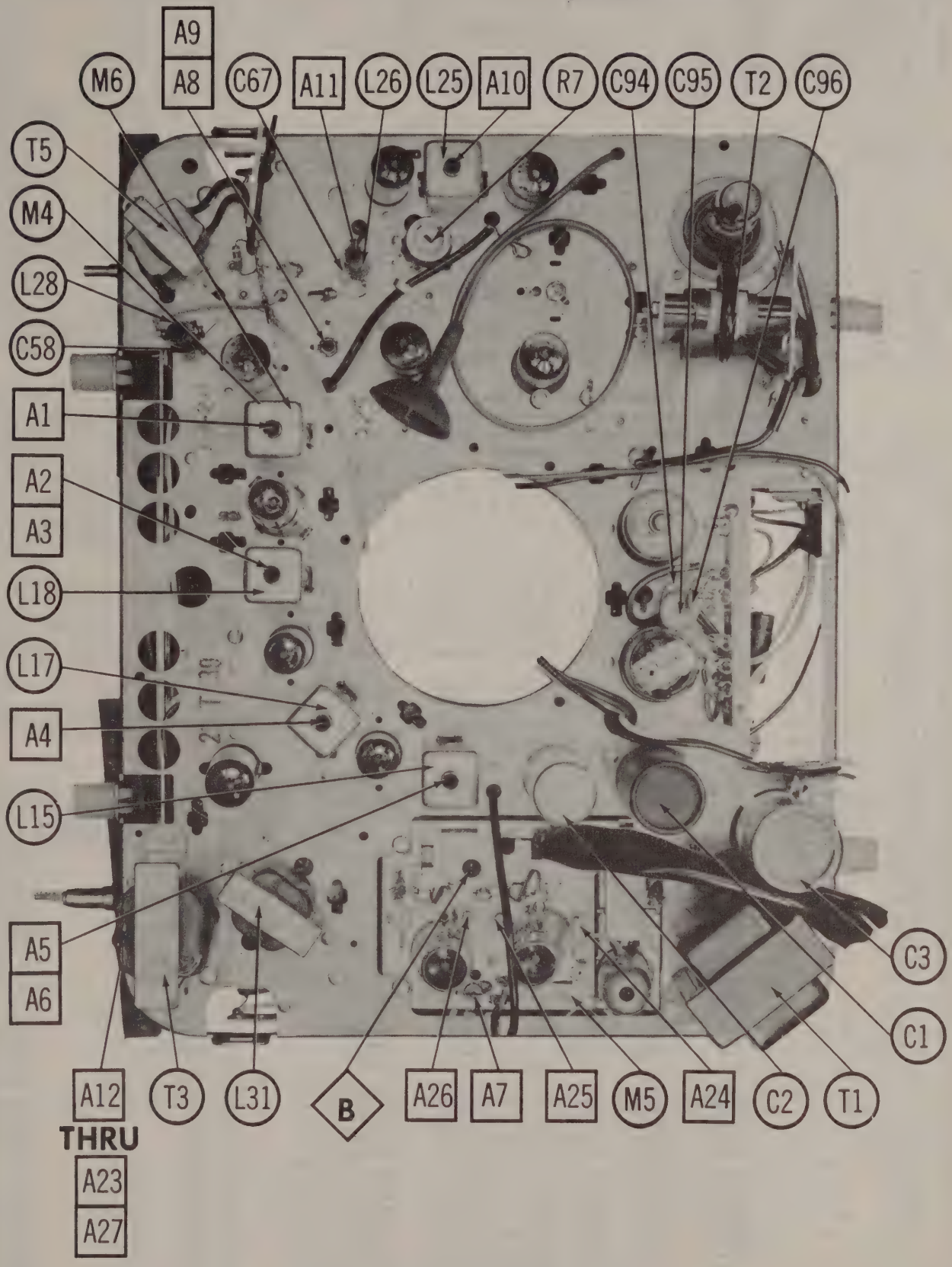


CHASSIS BOTTOM VIEW-CAPACIT

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS TOP VIEW

SET 326 FOLDER 10

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Oscillator	6AF4A	
V2	RF Amplifier	6BQ7A	
V3	Mixer-Oscillator	6AT8	
V4	1st. Video IF Amplifier	6CB6	
V5	2nd. Video IF Amplifier	6CB6	
V6	3rd. Video IF Amplifier	6CB6	
V7	Video Output-Sync Sep.	6AN8	
V8	Sound IF Amp.-Sync Amp.	6AN8	
V9	Audio Detector	6BN6	
V10	Audio Output	25BK5	
V11	Vert. Mult.-Vert. Output	12BH7	
V12	Horiz. AFC-Horiz. Osc.	12AU7	
V13	Horiz. Output	25BQ6GT	Note 1
V14	Damper	25AX4GT	
V15	HV Rectifier	1X2B	

Note 1. 25CU6 may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	RAYTHEON PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V16	21YP4A ①	21YP4A ① 21YP4	21YP4A ① 21YP4	21YP4A ② 21YP4	① Aluminized ② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RAYTHEON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	150	150	8C-22464	AFHS1-70	XA004	FP117	TM-150-150	T-050	TVL-1428
C2	150	150	8C-22463	AFHS1-70	XA004	FP117	TM-150-150	T-050	TVL-1428
C3A	100	300	8C-25309	RE1019	D114	WQ635		Q-310	R2194 *
B	10	300			BR505			MTD-4520	
C	25	450							
D	50	50							
C4	5	300	8C-24174	PRS350V4	BR435	TC60	TD-8-350	FM-3508	TVA-1601

* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RAYTHEON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	5		100S-24349	SI5	DD-050	G011	831-050	ZT-555	5GA-V5	
C6	5		100S-24349	SI5	DD-050	G011	831-050	ZT-555	5GA-V5	
C7	15		107S-25749							
C8	3.6		107S-25750							
C9	1000		107S-25742							
C10	1000		107S-25742							
C11	200		107S-25751							
C12	5		107S-25740							
C13	120		107S-25741	BPD-00012	DD-121	G044	811-121	UC-5312	5GA-T12	
C14	6.8		107S-25739	NPO-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C15	6.8		107S-25739	NPO-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C16	6.8		107S-25739	NPO-DI6.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C17	2.2		107S-25747	NPO-SI2.2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C18	1500		107S-25753	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C19	.5-3		105S-25232							
C20	1000		107S-25742							
C21	1500		107S-25753	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C22	.5-3		105S-25232		829-3		3115-01-0R5	CT565A		
C23	1000		107S-25743							
C24	.5-3		105S-25232		892-3		3115-01-0R5	CT565A		
C25	60		107S-25743							
C26	.5		107S-25744		TCZ-R5	TZ01	NP0A-0R5			
C27	5		100S-24349							
C28	10		107S-25746							
C29	1500		107S-25753	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C30	1500		107S-25753	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C31	68			N750-DI68	TCN-68	N038	N750L-680		5TCU-Q68	
C32	1000		107S-25742							
C33	1000		107S-25742							
C34	1000		107S-25742							
C35	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C36	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C37	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C38	680			SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C39	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C40	10			N750-SI10	TCN-10	TN01	N750K-100	NT-541	5TCU-T1	
C41	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	.22	200		P288N-22		CUB2P22		PT4022	2TM-P22	
C43	680			SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C44	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C45	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C46	10			N750-SI10	TCN-10	TN01	N750K-100	NT-541	5TCU-Q1	
C47	1000			SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C48	1000			SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C49	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C50	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C51	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C52	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C53	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C54	51									
C55	3.3			NP0-SI3.3	TCZ-3R3	TZ06	NP0A-3R3	ZT-5533	5TCCB-V33	
C56	33			NP0-SI33	TCZ-33	TZ18	NP0L-330	ZT-5433	5TCC-Q33	
C57	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C58	100			NP0-SI100	D6-101	TZ30	801-101	MCB235	MS-31	
C59	.022	600		BPD-02	DD-203	CUB6S22	817-02	PT6122	6TM-S22	
C60	.022	200		BPD-02	DD-203	CUB2S22	817-02	PT4122	2TM-S22	
C61	30		14B-23772							Note 1
C62	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C63	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C64	470			1469-00047	D6-471	5R5T47	811-471	MCB245	MS-347	
C65	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C66	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C67	10			NP0-SI10	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C68	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C69	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C70	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C71A	270					TP41	GP2K-271	UC-5327	5GA-T27	
B	10000		†17A-24212		†PA533	†PC-263	K082	811-01	DC-511	5HK-S1
C	25						TP25	GP1K-250	UC-5425	5GA-Q25
C72	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C73A	2000							DC-522		
B	5000		♦17A-22376		♦PA-110	♦PC-100	♦115TM1	♦1405-01	DC-525	♦V-1
C	5000								DC-525	
C74	2000			SI2000	D6-202	TP56	GP2-333-202	UC-522	5HK-D2	

ITEM No.	RATING		RAYTHEON PART No.	AEROVOX PART No.	CENTRALA PART No
	CAP.	VOLT			
C75	.1	200		P288N-1	DF-104
C76	.033	400		BPD-03	DF-303
C77	.1	200		P288N-1	DF-104
C78	.1	400		P488N-1	DF-104
C79	1000	1500	8G-24991	HVD-15-1000	DD30-10
C80	82			1469-000082	D6-820
C81	82			1469-000082	D6-820
C82	82			1469-000082	D6-820
C83	.047	200		BPD-05	DF-503
C84	.022	200		BPD-02	DD-203
C85	.47	200		P288N-47	
C86	.047	400		BPD-05	DF-503
C87	270			1469-00027	D6-271
C88	.01	600			
C89	1000			1464-001	
C90	.001	600		SI1000	D6-102
C91	.047	400		BPD-05	DF-503
C92	.1	600		P688N-1	DF-104
C93	.15	200		P288N-15	
C94	220	3000	8G-23953	HVD-30-220	DD30-22
C95	47	3000	8G-24026	HVD-30-47	DD30-47
C96	47	2000	8G-23645	HVD-30-47	DD30-47
C97A	5000			BPD-2X0047	DD2-502
B	5000				
C98	5000			BPD-005	DD-502
C99	5000	1500		HVD-15-4700	

Note 1. Shielded sound IF coupling lead.
† Items C71A, C71B, C71C, R56A and R56B are combined in on
♦ Items C73A, C73B, C73C, R63A, R63B and R63C are combi

CONT

ITEM No.	RATING		REPLACEMENT		
	RESISTANCE	WATTS	RAYTHEON PART No.	CENTRALAB PART No.	CLAROST/ PART No
R1A	1000Ω	½	B10A-23714	F1-4	RTV-486
B	1Meg	½		R2-52	
C	Switch			KB-1	
R2A	50KΩ	½	B10B-25297	AB-31	A47-50K-
B	Shaft		Not Req.	AK-4	KSS-3
R3A	500KΩ	½	B10B-25295	AB-59	A47-500K
B	Shaft		Not Req.	AK-4	KSS-3
R4A	150KΩ	½	B10B-25296	AB-43	A47-150K
B	Shaft		Not Req.	AK-4	KSS-3
R5A	6000Ω with 1000Ω stop	½	B10B-23407	♦ AB-10	♦ A47-500
B	Shaft		Not Req.	AK-1	FKS-½
R6A	3Meg	½	B10B-23696	AB-84	A47-3Meg
B	Shaft		Not Req.	AK-1	FKS-½
R7	750Ω	2	A10D-23857		39-750
R8A	3Meg	½	B10A-25667	B-84-S	A47-3Meg
B	Shaft		Not Req.	Not Req.	KSS-3
C	Switch		Not Req.	Not Req.	SWE-12

* Concentrikit Equivalent, K-6 Kit, Base Elements and Shafts:

† Universal Replacement (Mallory Exact Duplicate Part No. U
♦ Connect a 1000Ω resistor in series with the right hand termi
of the original control (control viewed from shaft end, termi

RESIST

All wattages 1/2 watt, or less

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RAYTHEON PART No.	IRC PART No.	
R9	680KΩ			BTS-680K	
R10	680KΩ			BTS-680K	
R11	10KΩ				
R12	680KΩ			BTS-680K	
R13	100KΩ			BTS-100K	
R14	4700Ω			BTS-4700	
R15	820KΩ			BTS-820K	
R16	560KΩ			BTS-560K	
R17	220KΩ			BTS-220K	
R18	10KΩ				
R19	3300Ω	1		BTA-3300	
R20	8200Ω				
R21	8200Ω				
R22	100KΩ				
R23	100KΩ			BTS-100K	
R24	220KΩ			BTS-220K	
R25	2.2Meg			BTS-2.2Meg	
R26	1000Ω			BTS-1000	
R27	1000Ω			BTS-1000	
R28	1000Ω			BTS-1000	
R29	4700Ω				
R30	1000Ω			BTS-1000	
R31	47Ω			BTS-47	
R32	1000Ω			BTS-1000	
R33	47KΩ			BTS-47K	
R34	1000Ω			BTS-1000	
R35	47Ω			BTS-47	
R36	2700Ω	3	9C11-1104		
R37	47KΩ			BTS-47K	
R38	1000Ω			BTS-1000	
R39	150Ω			BTS-150	
R40	1Meg			BTS-1Meg	
R41	4700Ω			BTS-4700	
R42	1Meg			BTS-1Meg	
R43	47Ω			BTS-47	
R44	5600Ω	2		BTB-5600	
R45	100KΩ			BTS-100K	
R46	33KΩ			BTS-33K	
R47	470KΩ			BTS-470K	
R48	33KΩ	1		BTA-33K	
R49	47Ω			BTS-47	
R50	680Ω			BTS-680	
R51	220KΩ			BTS-220	

DESCRIPTIONS
S (cont)

NELL-LIER No.	REPLACEMENT DATA: ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
32P1		PT401	2TM-P1	
36S33		PT6133	6TM-S33	
32P1		PT401	2TM-P1	
34P1		PT401	4TM-P1	
D1	1R5KV-102	DC3021	20GA-D1	
Q82	801-820		MS-482	
Q82	801-820		MS-482	
Q82	801-820		MS-482	
32S47		PT4147	2TM-S47	
32S22	817-02	CUB4S22	2TM-S22	
32P47		PT4047	2TM-P47	
34S47		PT4147	4TM-S47	
T27	811-271	MCE241	MS-327	
D1	811-102	MCB255	MS-21	
36D1	GP2L-102	PT621	6TM-D1	
34S47		PT4147	4TM-S47	
36P1		PT601	6TM-P1	
32P15		PT4015	2TM-P15	
'22	3KV-221	DC30322	30GA-T22	
147	3KV-470	DC30447	30GAB-Q47	
147	3KV-470	DC30447	20GAB-Q47	
179	811-005	DC-525	5HK-2D47	
	811-005	DC-525		
0	811-005	DC-525	5HK-D5	
	1R5KV-472		20HK-D5	

ne unit.

;

IRC ART No.	MALLORY PART No.	INSTALLATION NOTES
1-734	UF13L	Contrast (Panel)
	UR16A †	Volume (Rear)
	US-26	Attach to RIB.
123	TA54L	Horiz. Hold
Req.	Not Req.	Attach to R2A.
133	TA55L	Brightness
Req.	Not Req.	Attach to R3A.
129	TA184L	Vert. Hold
Req.	Not Req.	Attach to R4A.
1-114	♦ TA53L	Vert. Linearity
	Not Req.	Attach to R5A.
140	TA36L	Vert. Size
	Not Req.	Attach to R6A.
		Buzz-Wire Wound
140	U-59	Tuner AGC
Req.	Not Req.	Attach to R8A.
	US-26	Attach to R8A.

3 & P17-102 (Panel)
7 & R2-115 (Rear)
Switch)

e control and the lead connecting to the same terminal
m).

s otherwise listed.

EM lo.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RAYTHEON PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
52	18KΩ	2		BTB-18K	
53	22KΩ			BTS-22K	
54	150Ω	1		BTA-150	
55	10KΩ			BTS-10K	
56A	220KΩ		† 17A-24212	BTS-220K	
B	2.2Meg			BTS-2.2Meg	
57	100KΩ			BTS-100K	
58	560KΩ			BTS-560K	
59	22KΩ			BTS-22K	
60	1Meg			BTS-1Meg	
61	4700Ω	1		BTA-4700	
62	1000Ω			BTS-1000	
63A	22KΩ			BTS-22K	
B	8200Ω		♦17A-22376	BTS-8200	
C	8200Ω			BTS-8200	
64	4700Ω			BTS-4700	
65	75KΩ 5%			BTS-75K 5%	Note 1
66	2.2Meg			BTS-2.2Meg	
67	100KΩ			BTS-100K	
68	100KΩ			BTS-100K	
69	3.3Meg			BTS-3.3Meg	
70	3300Ω	5	9C12-1105	PW7-3300	
71	560Ω				
72	560Ω				
73	330KΩ				
74	820KΩ				
75	220KΩ				
76	68KΩ			BTS-68K	
77	3900Ω			BTS-3900	
78	39KΩ				
79	18KΩ			BTS-18K	
80	68KΩ			BTS-68K	
81	82KΩ			BTS-82K	
82	100KΩ			BTS-100K	
83	68KΩ			BTS-68K	
84	47KΩ	1		BTA-47K	
85	4700Ω			BTS-4700	
86	100Ω				
87	470KΩ			BTS-470K	
88	8200Ω	2		BTB-8200	
89	1.5Ω		9C1-1065	BW½-1.5	
90	2500Ω	5	9C-24033	PW7-2500	
91	133Ω	15	9C-23872		

RESISTORS (cont)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RAYTHEON PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R92	9Ω	5	46M-23018		
R93	330KΩ			BTS-330K	
R94	470KΩ			BTS-470K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RAYTHEON PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R95	470KΩ		9B1-29	BTS-470K	
R96	220KΩ			BTS-220K	Note 2

Note 1. Some versions use a 68KΩ ½W resistor in this application.
Note 2. Not used in some versions.
† Items R56A, R56B, C71A, C71B, C71C are combined in one unit.
♦ Items R63A, R63B, R63C, C73A, C73B, C73C are combinedin one unit.

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: RAYTHEON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⓐ.3A	12VCT ⓐ2.1A			12D23699-3	F5526 ①	P-2959	P-8130	21F67	

① Drill new mounting holes.

TRANSFORMEPS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: RAYTHEON PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Horiz. Output Trans.	12E-23939	FB457 *	HV0-58 *		X126 *		FLY-80 *	D-71 *
T3	Vert. Output Trans.	12E-23726-1	Z1804	A-3037	222T1	V313	A-8123	26S52	A-102X
T4A	Yoke-Horiz. (8.5MH)	201-24563-1①	DF601③④	MDF-70③	206D1③④	Y70F08③	DY-8A③	Y-5③④	Y-12-1③④
B	Vert. (45MH)	16M-24493 ②		④		④	④		

① Includes resistors R71 and R72.
② Yoke rear cover and centering device.
③ Requires new centering device.
④ Use original horizontal yoke damping network.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	8	8		8		8	8
	6	6	6		6		6	6
	3	3	3		3		3	3
	2	2	2		2		2	2

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: RAYTHEON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	6.4KΩ	3-4Ω	12C-23704	Z1113	A-3026	A-3878	24S60	S-7X	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: RAYTHEON PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	6"	PM	3-4Ω	C18A-25937	6A1	229S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: RAYTHEON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Mixer Coil	0Ω		107S-25761				Tapped
L2	UHF Osc. Coil	0Ω		107S-25764				
L3A	Fil. Choke	0Ω						
B	Fil. Choke	0Ω		107S-25766				
L4	Cathode Choke	0Ω		107S-25765				
L5	UHF IF Coil	0Ω		107S-25763				
L6	UHF IF Coil	0Ω		107S-25762				
L7A	VHF Ant. Match. Trans.	0Ω	0Ω					
B	VHF Ant. Match. Trans.	0Ω	0Ω	107S-25754				
L8	IF Trap Coil	.2Ω		107S-25757				
L9	IF Trap Coil	0Ω		107S-25756				
L10A	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-2				Channel 2
B	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-3				Channel 3
C	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-4				Channel 4
D	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-5				Channel 5
E	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-6				Channel 6
F	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-7				Channel 7
G	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-8				Channel 8
H	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-9				Channel 9
I	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-10				Channel 10
J	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-11				Channel 11

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RAYTHEON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
K	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-12				Channel 12
L	VHF Ant., RF Mixer Grid & Osc. Coils	0Ω		107S-25755-13				Channel 13
M	UHF IF Strip	0Ω		107S-25760				Includes 2.7KΩ resistor
L11	Fil. Choke	0Ω		107S-25767				
L12	Neut. Coil	0Ω		105S-25255				
L13	RF Coil	0Ω		107S-25758				
L14	Conv. Plate	.1Ω		107S-25759				
L15	1st. Video IF			13A-24203				Includes 41.25MC trap
L16	Fil. Choke	0Ω		16A-25688	19-1001		4604	1.5 Microhenries
L17	2nd. Video IF	.1Ω	.1Ω	13A-24224	17-5001 *	TV-125 *	6231 *	
L18	3rd. Video IF	.1Ω	.1Ω	13A-24937	17-5003 *	TV-128 *	6233 *	Includes 47.25MC trap
L19	Series Peaking Coil	1.8Ω		16A-22427	19-1004		4610	7.5 Microhenries
L20	Shunt Peaking Coil	24Ω		16A-21391	19-3300		6155	305 Microhenries
L21A	4.5MC Trap	1.9Ω		201-23729				
B	1st. Sound IF	3Ω						
L22	Series Peaking Coil	8.5Ω		16A-19365	19-4400 ■		6136 ■	410 Microhenries, wound on 3.9KΩ resistor
L23	Shunt Peaking Coil	8Ω		16A-20970	19-3250	TV-185	6130	270 Microhenries
L24	Series Peaking Coil	2.9Ω		16A-24090	19-1005		4612	11 Microhenries
L25	2nd. Sound IF	.4Ω	.4Ω	201-23873				
L26	Quadrature Coil	5.3Ω		201-23727			1480	
L27	RF Choke	1.7Ω		16A-21701	19-1005		4612	8 Microhenries
L28	4.5MC Trap	1Ω		16A-25441				

* Cut out chassis hole and use adaptor plate.
■ Parallel with 3.9KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RAYTHEON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L29	83Ω		201-24472			6212				Tapped @ 58Ω - horiz. osc.
L30	36Ω		201-24473-1			6314				Horiz. stabilizer

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA RAYTHEON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L31	.200ADC	37.5Ω	.5 HY	16A-23889-1	C5040	C-2994	C-2327	26C41	C-23X

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA RAYTHEON PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.230ADC	21J23840	1236A	MR300	6S300	6Q4	300	
M2	.230ADC	21J23840	1236A	MR300	6S300	6Q4	300	

CRYSTAL DIODES

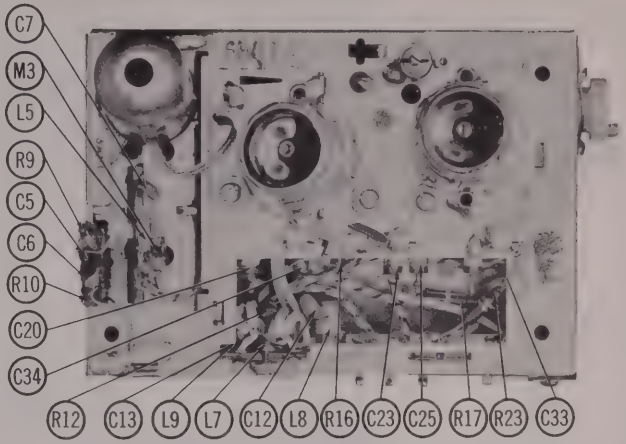
ITEM No.	ORIG. TYPE	REPLACEMENT DATA RAYTHEON PART No.	REPLACEMENT DATA SYLVANIA PART No.	NOTES
M3	1N82A	31K-111		UHF Mixer (Clip-in)
M4	1N295*	1N60		Video Detector (Pigtail)

* Some versions may use crystal diode type CK706 in this application.

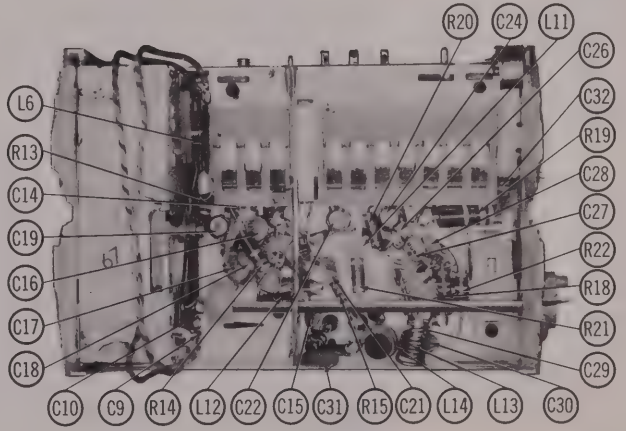
MISCELLANEOUS

ITEM No.	PART NAME	RAYTHEON PART No.	NOTES
M5	Tuner	211-25394	VHF-UHF combination
M6	Video Det. Assy.	13B-24206	Includes M4, coils and capacitors
M7	Centering Device	16M-24493	Includes deflection yoke (T4) rear cover
M8	Width Control	2C-25229	
M9	Ion Trap	16M-19705 *	
	Cabinet	2B-25330-A177	Model UC-2185M
	Cabinet	2B-25330-A178	Model UC-2185B
	Knob	5B-25412-A29	Fine tuning - Model UC-2185B
	Knob	5B-25412-A76	Fine tuning - Model UC-2185M
	Knob	5B-24138-A29	Picture - Model UC-2185B
	Knob	5B-24138-A76	Picture - Model UC-2185M
	Knob	5B-25413-A56	VHF Indicator
	Knob	5B-25421-A56	On-off-volume - Model UC-2185B
	Knob	5B-25419-A56	On-off-volume - Model UC-2185M
	Knob	5B-25416-A76	UHF Indicator - Model UC-2185M
	Knob	5B-25416-A56	UHF Indicator - Model UC-2185B
	Knob	5B-23839-A76	Control (3 Used) - Model UC-2185M
	Knob	5B-23839-A56	Control (3 used) - Model UC-2185B
	Safety Glass	30M-25418	
	Mask	25M-25301	

* Alternate part #16M-19706.



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

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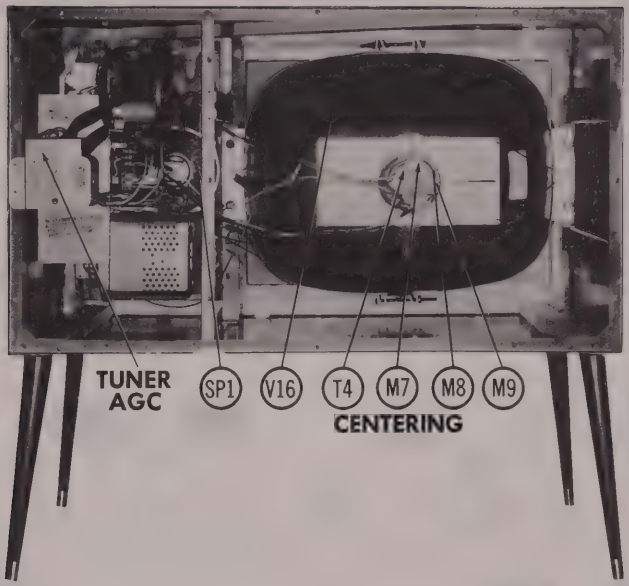
COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the horizontal hold control (R2) to its mid-range position.

Connect a short clip lead across L30. Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Remove clip lead from L30. Connect the vertical amplifier of the oscilloscope thru a low capacity probe to point ⊕. Low side to chassis.

Adjust the horizontal phase slug (B2) until a waveform similar to Fig. 8 is obtained. While making this adjustment, keep picture in sync with the horizontal hold and Bi-Remove the scope connection. Turn R2 fully counter clockwise and then fully clockwise. The picture should fall out of sync at both extreme settings of R2.

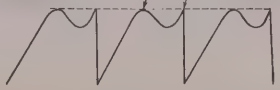


FIG. 8

PROF
L. F. SLA
392[illegible] ME[illegible]
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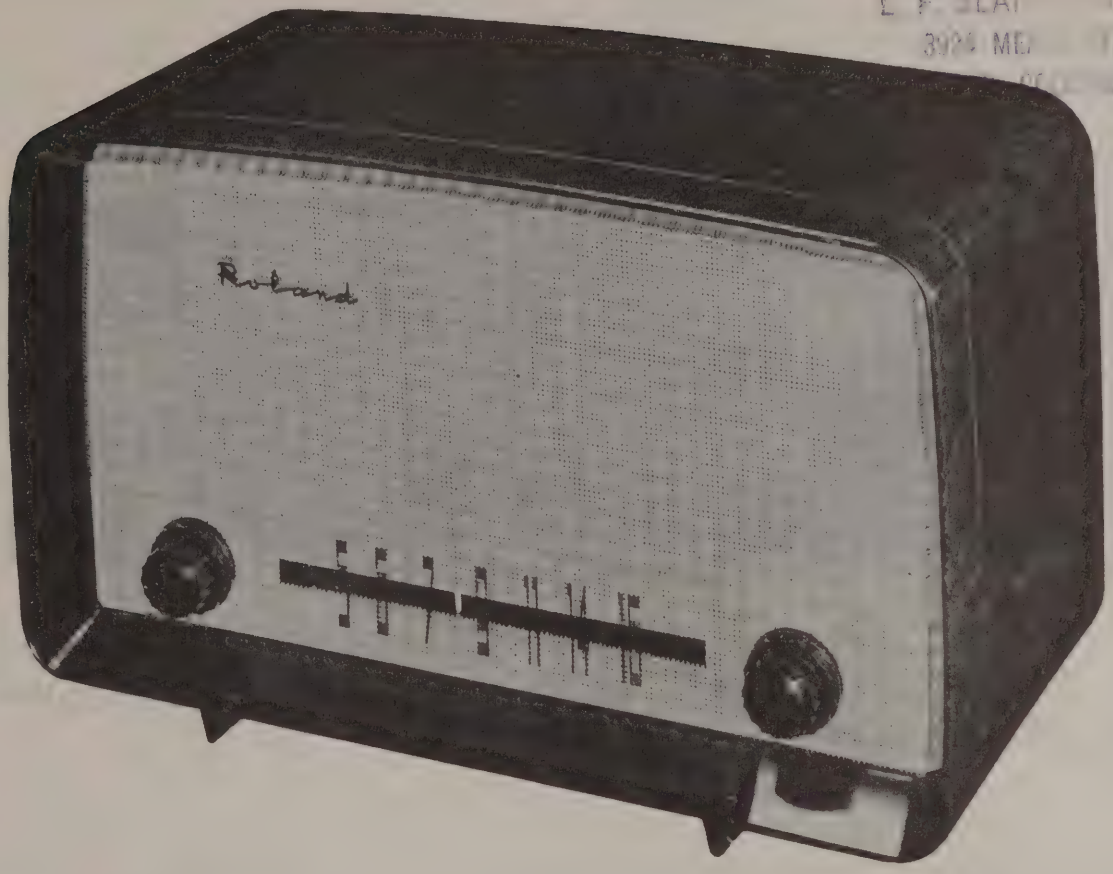

ROLAND
MODEL 6T6

TRADE NAME	Roland Model 6T6
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Six)	Types 6BJ6 RF Amplifier, 12BE6 Converter, 6BJ6 IF Amplifier, 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	530KC-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	"	1610KC	"	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

ROLAND
Model 6T6

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BJ6	
V2	Converter	12BE6	
V3	IF Amplifier	6BJ6	
V4	Det. -AVC-AF Amp.	12AT6	
V5	Output	50C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ROLAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PRS150V4040-20	BBRT44215	TCT3116	TDL-404020-150	FMT-315	TVA-3448
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA								NOTES
	CAP.	VOLT	ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.		
C2	. 05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5		
C3	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5		
C4	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27		
C5	. 01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1		
C6	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27		
C7	. 01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1		
C8	2000			BPD-002	DD-203	K072	801-002	DC-522	5HK-D2		
C9	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1		
C10	. 05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5		
C11	. 1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1		

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	1/2	VC-200S	F1-40		* QJ-887R	UF55L	Tone (Panel)
B	500KΩ	1/2		R2-41			UR55A	Volume (Rear)
C	Switch			KB-1			US-26	Attach to R1B.

* Concentrikit Equivalent, K-6 Kit, Base Elements and Shafts; B11-133, P17-102 (Panel)
B13-133, R2-115 (Rear)
76-1 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

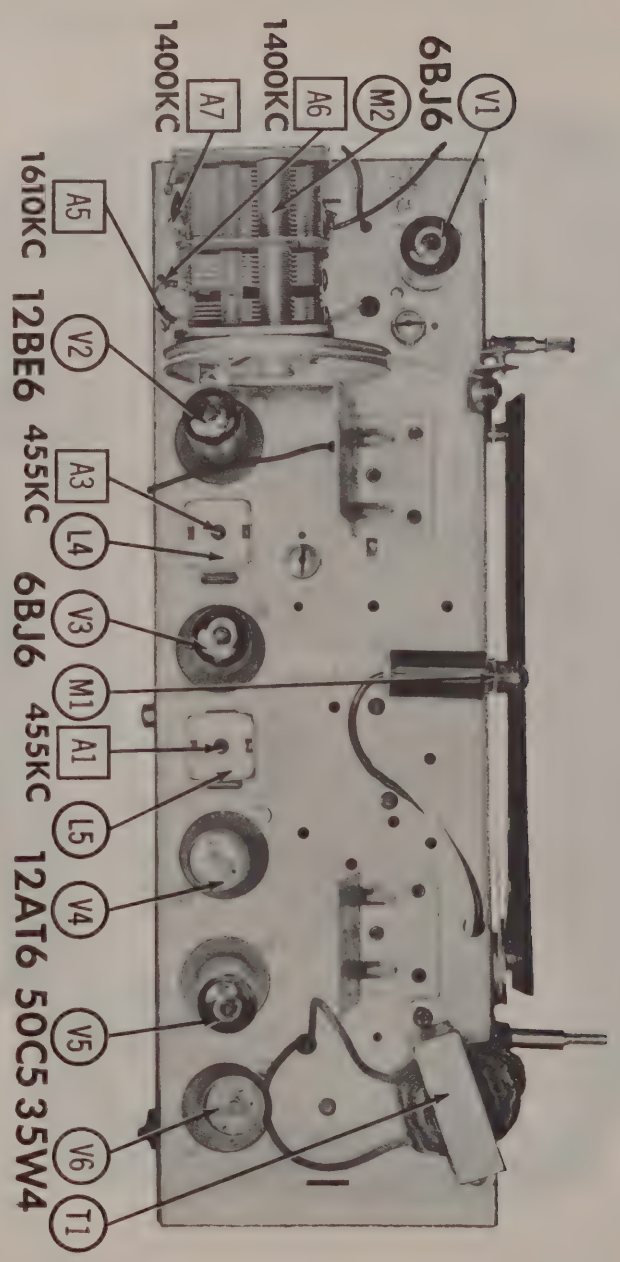
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R2	220Ω			BTS-220	
R3	2200Ω			BTS-2200	
R4	470KΩ			BTS-470K	
R5	12KΩ			BTS-12K	
R6	150Ω			BTS-150	
R7	2. 2Meg			BTS-2. 2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R8	4. 7Meg			BTS-4. 7Meg	
R9	220K			BTS-220K	
R10	150Ω	1		BTA-150	
R11	330Ω	1		BTA-330	
R12	2200Ω	1		BTA-2200	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ROLAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.45KΩ	3-4Ω		Z1001	A-2903	A-3332 ①	24S50	S-1X	① Drill one new mtg. hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

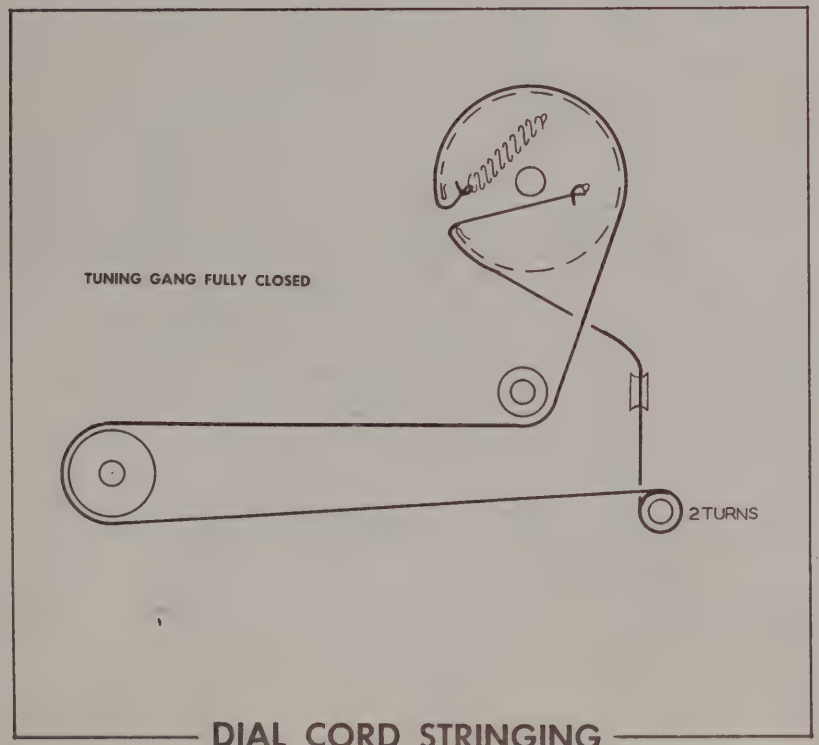
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5"	PM	3-4Ω				
SP2	5"	PM	3-4Ω				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ROLAND PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	1.1Ω						
L2	RF Coil	9Ω	8.5Ω		14-1076			
L3	Osc. Coil	1.2Ω	9.5Ω					
L4	Input IF	20Ω	20Ω	LF-50	16-6758	BC-352	12-C1	
L5	Output IF	20Ω	20Ω	LF-50	16-6758	BC-353	12-C2	

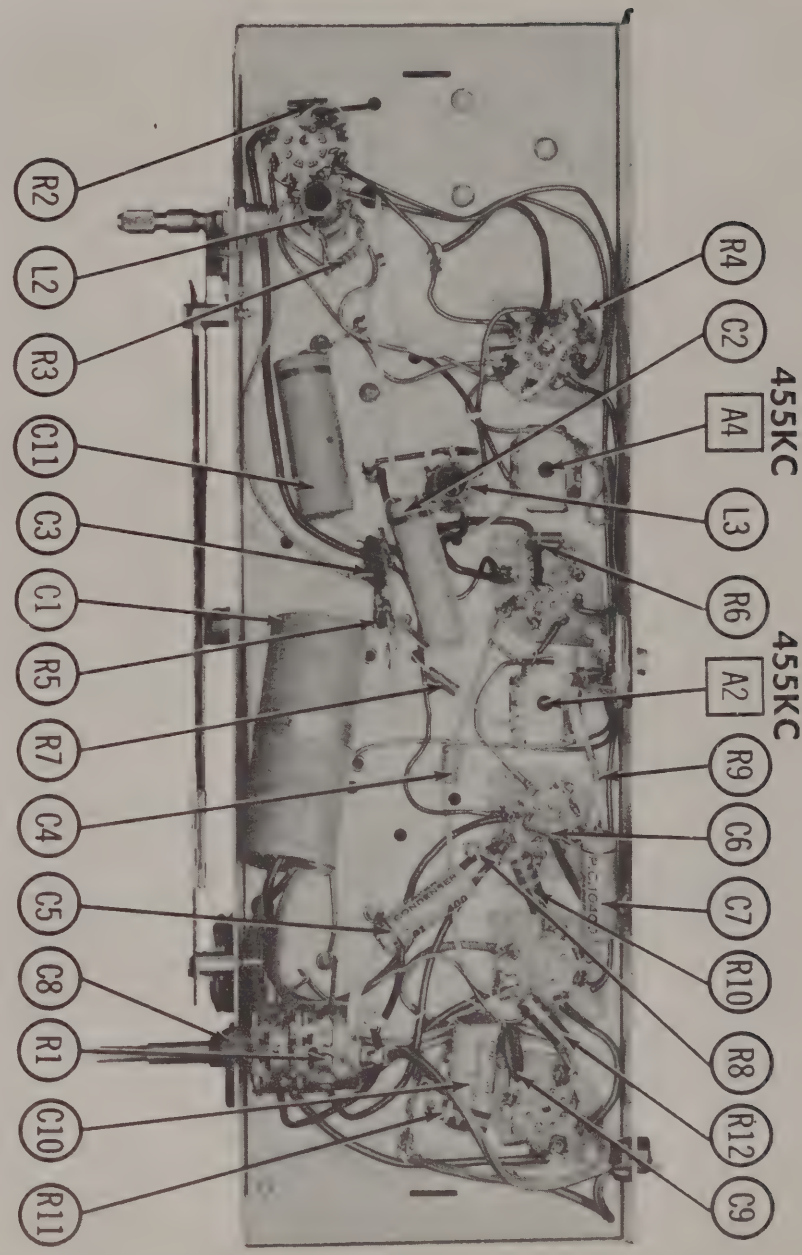
MISCELLANEOUS

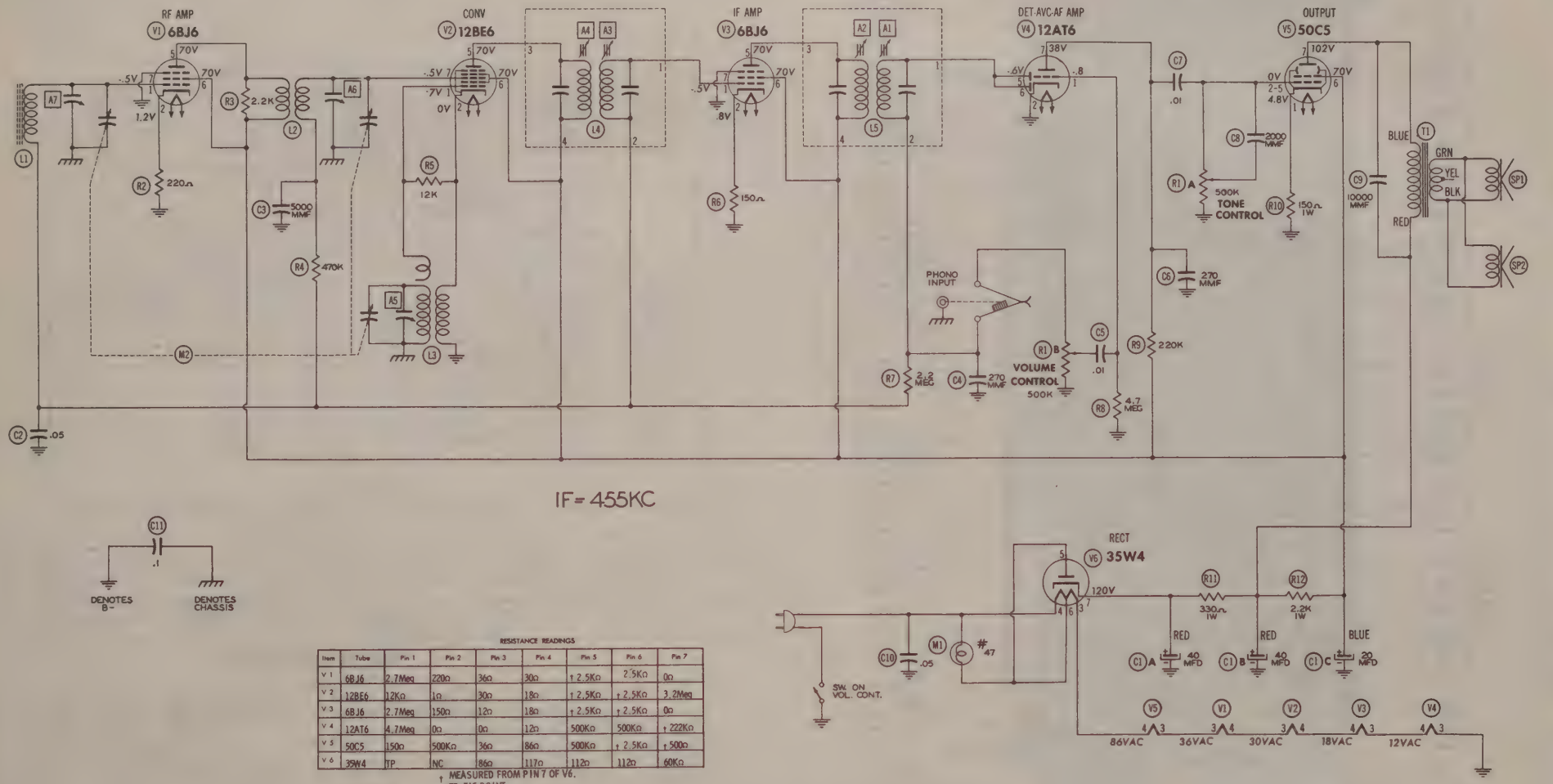
ITEM No.	PART NAME	ROLAND PART No.	NOTES
M1	Dial Light		#47
M2	Tuning Cap.	CV-55	3 Gang (35-510MMF, 14-210MMF, 9-190MMF)



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BJ6	2.7Meg	220Ω	36Ω	30Ω	↑ 2.5KΩ	2.5KΩ	0Ω
V 2	12BE6	12KΩ	1Ω	30Ω	18Ω	↑ 2.5KΩ	↑ 2.5KΩ	3.2Meg
V 3	6BJ6	2.7Meg	150Ω	12Ω	18Ω	↑ 2.5KΩ	↑ 2.5KΩ	0Ω
V 4	12AT6	4.7Meg	0Ω	0Ω	12Ω	500KΩ	500KΩ	↑ 222KΩ
V 5	50C5	150Ω	500KΩ	36Ω	86Ω	500KΩ	↑ 2.5KΩ	↑ 500Ω
V 6	35W4	TP	NC	86Ω	117Ω	112Ω	112Ω	60KΩ

↑ MEASURED FROM PIN 7 OF V6.
TP-TIE POINT.
NC-NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder
*TRADE MARK

SENTINEL MODELS 1U-1202C, 1U-1205C, 1U-1208, 1U-1212, 1U-1215, 1U-1218 (Series A, B)

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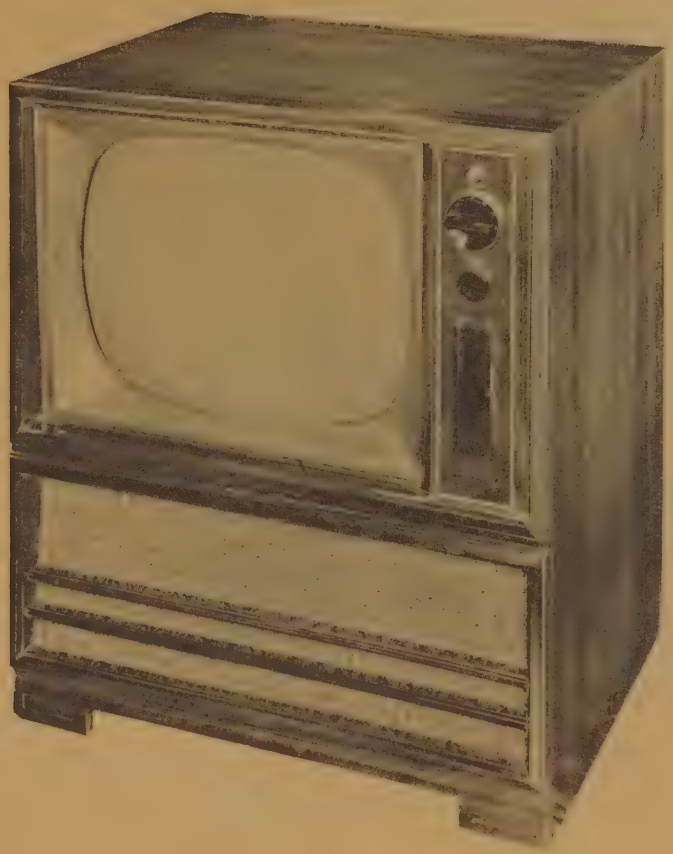

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SENTINEL MODELS 1U-1202C, 1U-1205C, 1U-1208, 1U-1212, 1U-1215, 1U-1218 (Series A, B)

SENTINEL MODEL 1U-1205C (Series "B" Chassis)

TRADE NAME	Sentinel Models 1U-1202, 1U-1205, 1U-1205C, 1U-1208, 1U-1212, 1U-1215, 1U-1218 (Series A, B Chassis)
MANUFACTURER	Sentinel Radio Corp., 2100 W. Dampster St., Evanston, Illinois
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 2.2 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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Tube Placement Chart (Top View) 5

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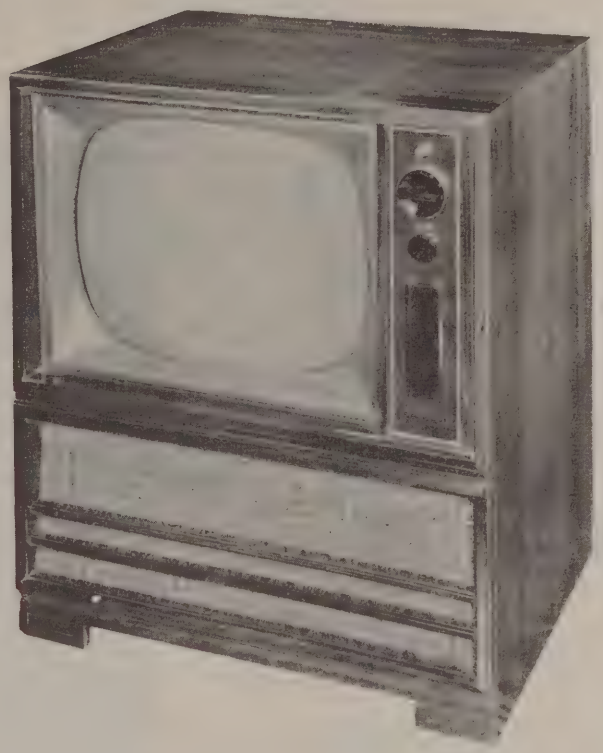
PHOTOFACT* Folder
*TRADE MARK

SENTINEL MODELS 1U-1202C, 1U-1205C, 1U-1208, 1U-1212, 1U-1215, 1U-1218 (Series A, B)



DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.

2. Remove 7 wood screws and 1 metal screw. Remove rear cover.

3. Remove picture tube socket, HV lead, yoke plug, speaker leads and ground strap.

4. Remove 3 wood screws holding chassis mounting board to cabinet. Remove chassis.

5. Remove 6 speaker nuts. Remove 2 speakers.

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MODELS	CHASSIS
1U-1202, 1U-1205, 1U-1205C, 1U-1208, 1U-1212, 1U-1215, 1U-1218	Series A & B

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the left of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 5 wood screws holding metal molding at the top edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit may be made from the front panel service controls. Adjust the horizontal hold control until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L15) located on top of the chassis.

FUSES

Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

SENTINEL MODELS 1U-1202C, 1U-1205C, 1U-1208, 1U-1212, 1U-1215, 1U-1218 (Series A, B)

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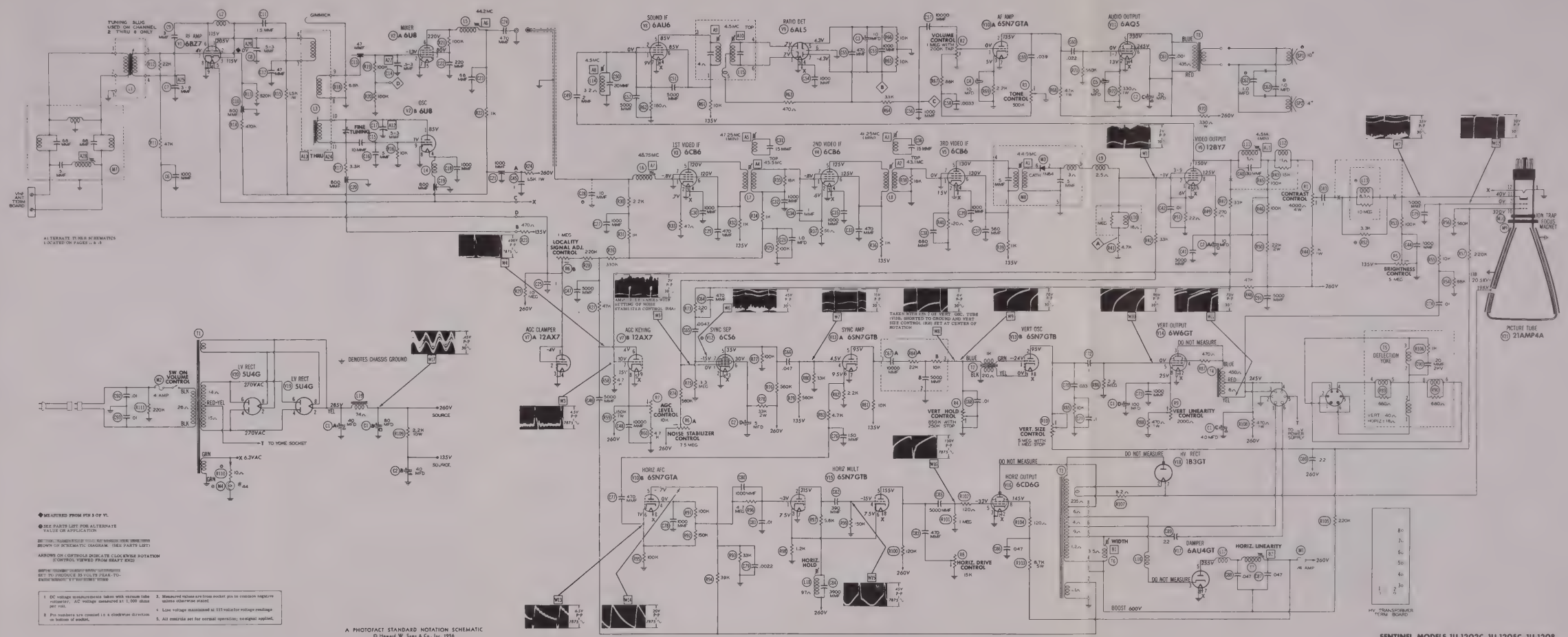
TUNING SLUG USED ON CHANNEL 2 THRU 6 ONLY
GIMMICK
RF AMP V1 6BZ7
MIXER V2A 6U8
OSC V2B 6U8
FINE TUNING
44.2MC
SOUND IF V9 6AU6
RATIO DET V9 6AL5
VOLUME CONTROL 1 MEG WITH 250K TAP
AF AMP V10A 6SN7GTA
TONE CONTROL 500K
AUDIO OUTPUT V11 6AQ5
BLUE
RED
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6CB6
VIDEO OUTPUT V6 12BY7
CONTRAST CONTROL 4000Ω 4W
BRIGHTNESS CONTROL 5 MEG
ION TRAP FOCUS MAGNET
PICTURE TUBE V21 21AMP4A
LOCALITY SIGNAL ADJ. CONTROL 1 MEG
AGC CLAMPER V7A 12AX7
AGC KEYING V7B 12AX7
SYNC SEP V13B 6CS6
AGC LEVEL CONTROL 10K
NOISE STABILIZER CONTROL 7.5 MEG
SYNC AMP V13A 6SN7GTB
VERT OSC V13B 6SN7GTB
VERT HOLD CONTROL 650K WITH 250K STOP
VERT SIZE CONTROL 5 MEG WITH 1 MEG STOP
VERT OUTPUT V14 6W6GT
DO NOT MEASURE
VERT LINEARITY CONTROL 2000Ω
DEFLECTION YOKE
HORIZ AFC V15B 6SN7GTA
HORIZ MULT V15A 6SN7GTB
HORIZ OUTPUT V16 6CD6G
HV RECT V18 1B3GT
HORIZ. HOLD
HORIZ. DRIVE CONTROL 15K
WIDTH
DAMPER V17 6AU4GT
HORIZ. LINEARITY
BOOST 600V
SW. ON VOLUME CONTROL
LV RECT V20 5U4G
LV RECT V19 5U4G
270VAC
285V
TO YOKE SOCKET
DENOTES CHASSIS GROUND
260V SOURCE
135V SOURCE
HV TRANSFORMER TERM BOARD
VHF ANT. TERM BOARD
ALTERNATE TUNER SCHEMATICS LOCATED ON PAGES 7 & 8
AMPLITUDE SAME AS W6 WITH SETTING OF NOISE STABILIZER CONTROL (R64)
TAKEN WITH 100 MV INT. OSC. TUBE (V13B) SHORTED TO GROUND AND VERT SIZE CONTROL (R68) SET AT CENTER OF ROTATION
◆ MEASURED FROM PIN 5 OF V1.
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
SET TO PRODUCE 35 VOLTS PEAK-TO-PEAK SIGNAL AT TV SET SCREEN
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SENTINEL MODELS 1U-1202C, 1U-1205C, 1U-1208, 1U-1212, 1U-1215, 1U-1218 (Series A, B)

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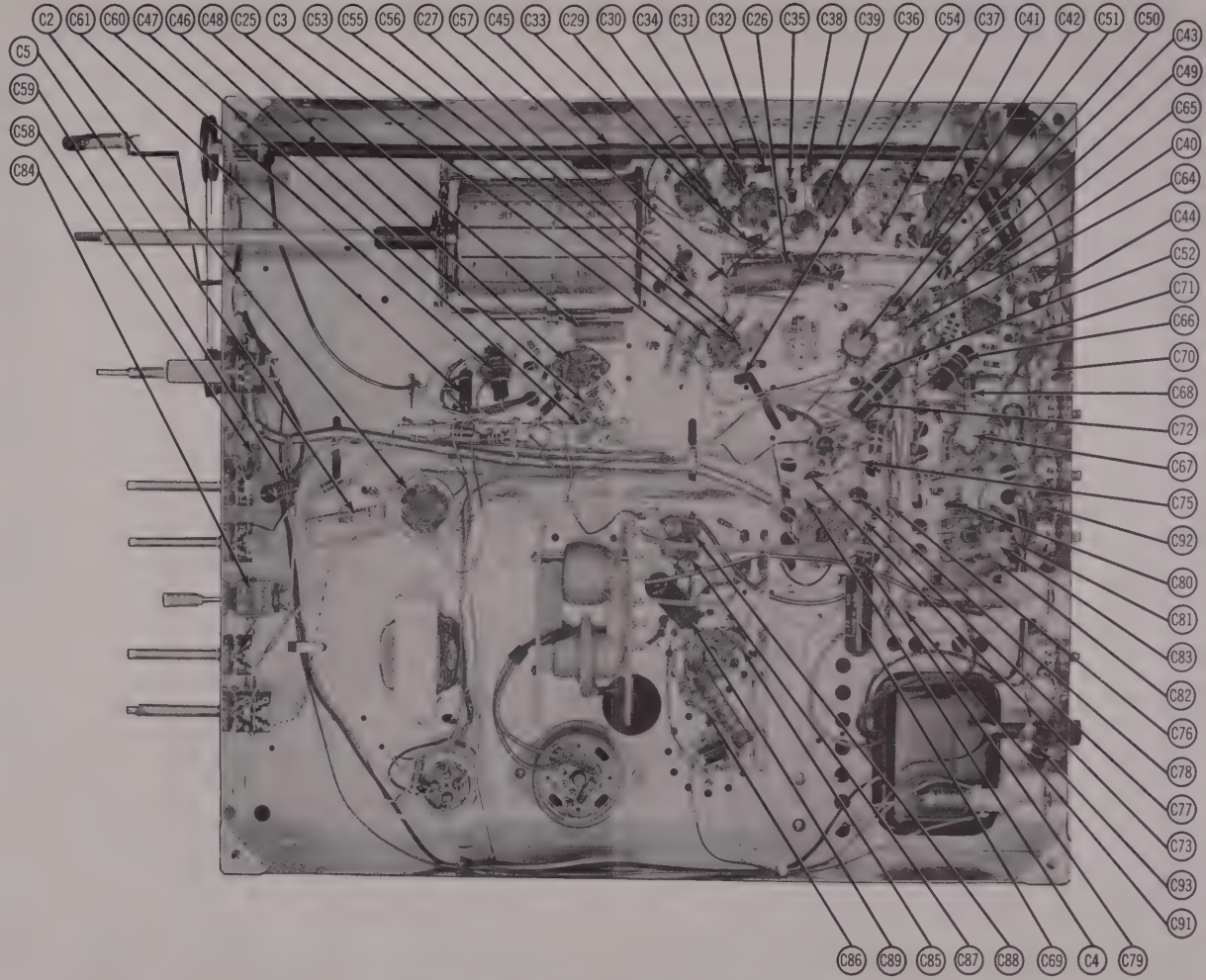
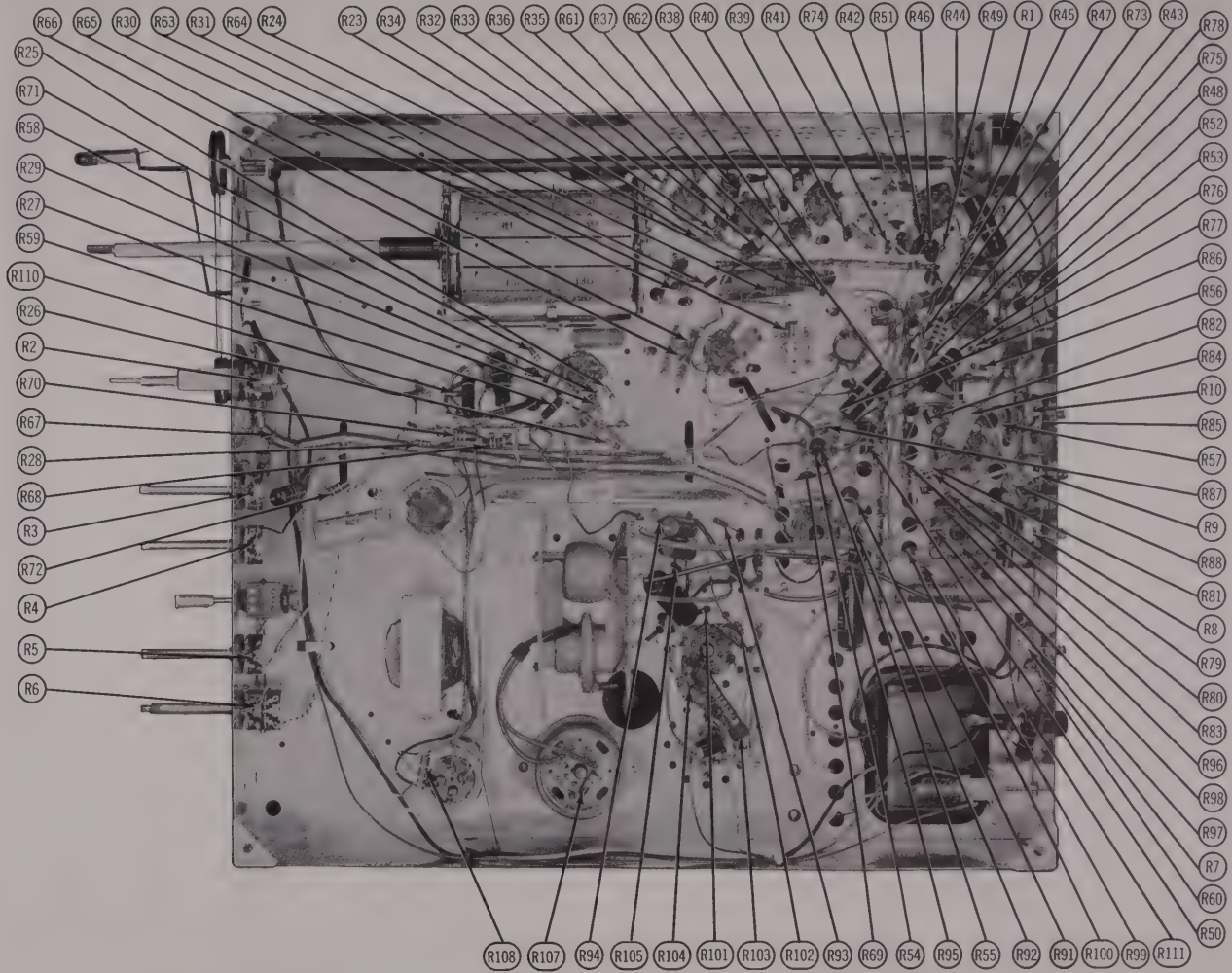


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



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CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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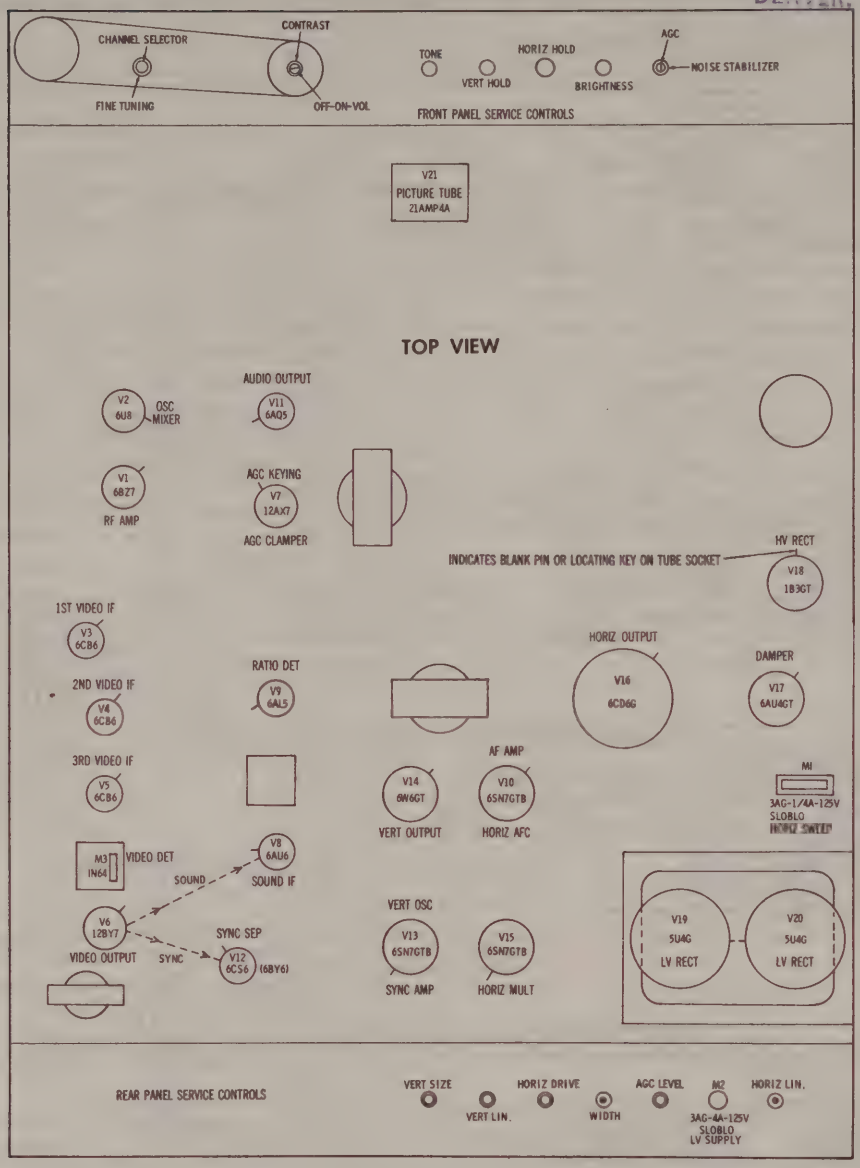
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19, V20, Fuse (M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V21
Has pic, no sound - V8, V9, V10, V11
Overloaded picture - V7

SYNC FAILURE
No vert. sync - V13
No horiz. sync - V10, V13, V15
No vert. or horiz. sync - V12, V13

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V21, Fuse (M1)
No vertical deflection - V13, V14
Poor vert. linearity or foldover - V13, V14
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, V19, V20
Vert. off freq. - V13
Horiz. off freq. - V10, V13, V15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal multivibrator tube (V15) to disable the high voltage.
Allow a 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias battery to the ungrounded side of C26. Connect the positive lead to chassis. Use only enough generator output to provide useable indication on VTVM.
Set "Locality Switch" (rear panel) to "Strong" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	44.0MC	3	DC probe thru 47KΩ to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	43.1MC	"	"	A2	"
3.	"	"	41.25MC	"	"	A3	Adjust for MINIMUM deflection. Repeat steps 1 and 2.
4.	"	"	45.5MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	47.25MC	"	"	A5	Adjust for MINIMUM deflection. Repeat steps 4 and 5.
6.	"	"	44.2MC	"	"	A6	Detune A7 by adjusting fully counter clockwise. Adjust A6 for maximum deflection.
7.	"	"	45.75MC	"	"	A7	Adjust for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough generator output to provide useable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	44MC (10MC Swp.)	41.25MC 42.25MC 45.75MC 47.25MC	3	Vert. amp. thru 47KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, retouch SLIGHTLY A1, A2, A4, A6, and A7 to obtain desired response. To view 41.25MC and 47.25MC markers, temporarily remove bias battery and increase scope gain and marker generator output. Markers should fall in trap notches as in Fig. 1.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set the contrast control fully clockwise.
Attenuate generator output to provide approximately 5 volts at the VTVM.
Remove the third video IF amplifier (V5) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to junction of L9 and L10. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru 47KΩ to point (B). Common to chassis.	A8, A9	Adjust for maximum deflection.
10.	"	"	"	"	DC probe thru 47KΩ to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V5 in its socket for final adjustment of A10 is best made with a TV station tuned in. Adjust A10 for MINIMUM buzz in sound.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.
Set contrast control fully clockwise.
Remove V5 from its socket.
Use only enough sweep generator output to provide useable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD	High side to junction of L9 and L10. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. thru 47KΩ to point (B). Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
10.	"	"	"	"	"	Vert. amp. thru 47KΩ to point (C). Low side to chassis.	A10	Reconnect C3. Adjust so that 4.5MC occurs at center of crossover lines as shown in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines. Replace V5 in its socket.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MFD	High side to pin 11 (cathode) of picture tube. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru 47KΩ to point (B). Common to chassis.	A11	Adjust for MINIMUM deflection. Replace V5 in its socket.

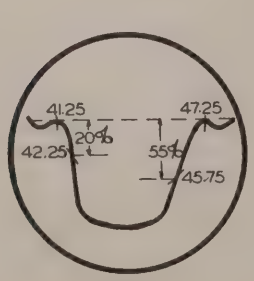


FIG. 1

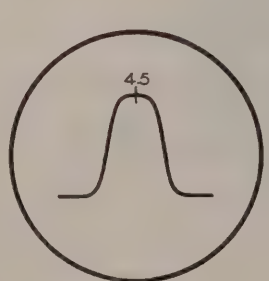


FIG. 2

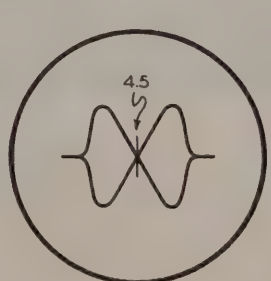


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Leave the bias connected as under "Video IF Alignment". Restore tube shield on converter tube (V2) to its normal position. Complete oscillator alignment may not be necessary in sets using the "U" type tuner. If the oscillator seems to be off frequency approximately the same amount for the majority of the channels in the "U" type tuner, it may be possible to correct them in one step using A12. It should be noted that this is an all channel adjustment and should not be used to correct any individual channel. A12 is not provided on "D" type tuner. If A12 will not bring all the channels well within range of the fine tuning control it will be necesseary to adjust the channel strip adjustment for each channel off frequency. The channel oscillator adjustment screws are reached through a hole above and just to the left of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp.)	211. 25MC 215. 75MC	13	Vert. amp. thru 47KΩ to point (A). Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 55%.
			207MC (10MC Swp.)	205. 25MC 209. 75MC	12		A14	
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11		A15	
			195MC (10MC Swp.)	193. 25MC 197. 75MC	10		A16	
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9		A17	
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8		A18	
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7		A19	
			85MC (10MC Swp.)	83. 25MC 87. 75MC	6		A20	
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5		A21	
			69MC (10MC Swp.)	67. 25MC 71. 75MC	4		A22	
			63MC (10MC Swp.)	61. 25MC 65. 75MC	3		A23	
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2		A24	

RF AND MIXER ALIGNMENT

Set the locality switch to "Strong" position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205. 25MC 209. 75MC	12	Vert. amp. thru 10KΩ to point (D). Low side to chassis.	A25, A26, A27	Check for response curve similar to Fig. 5 with markers above 90%.
14.	"	"	213MC (10MC Swp.)	211. 25MC 215. 75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel, make compromise adjustment of A25, A26, and A27 with channel selector set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp.)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp.)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp.)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp.)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2			

40MC TRAP ALIGNMENT

The 40MC trap (A28) will require adjustment only where a local interfering signal from 40MC to 45MC affects the picture. In such cases A28 should be adjusted for MINIMUM 40MC beat interference in picture.

UHF TUNER ALIGNMENT

The UHF tuner has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver is not recommended in the field.

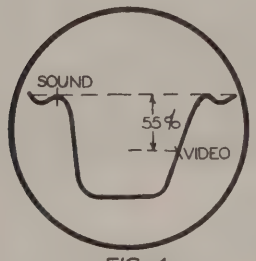


FIG. 4

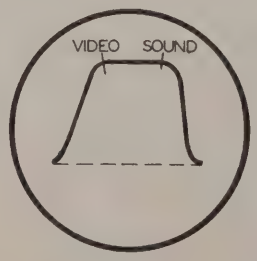
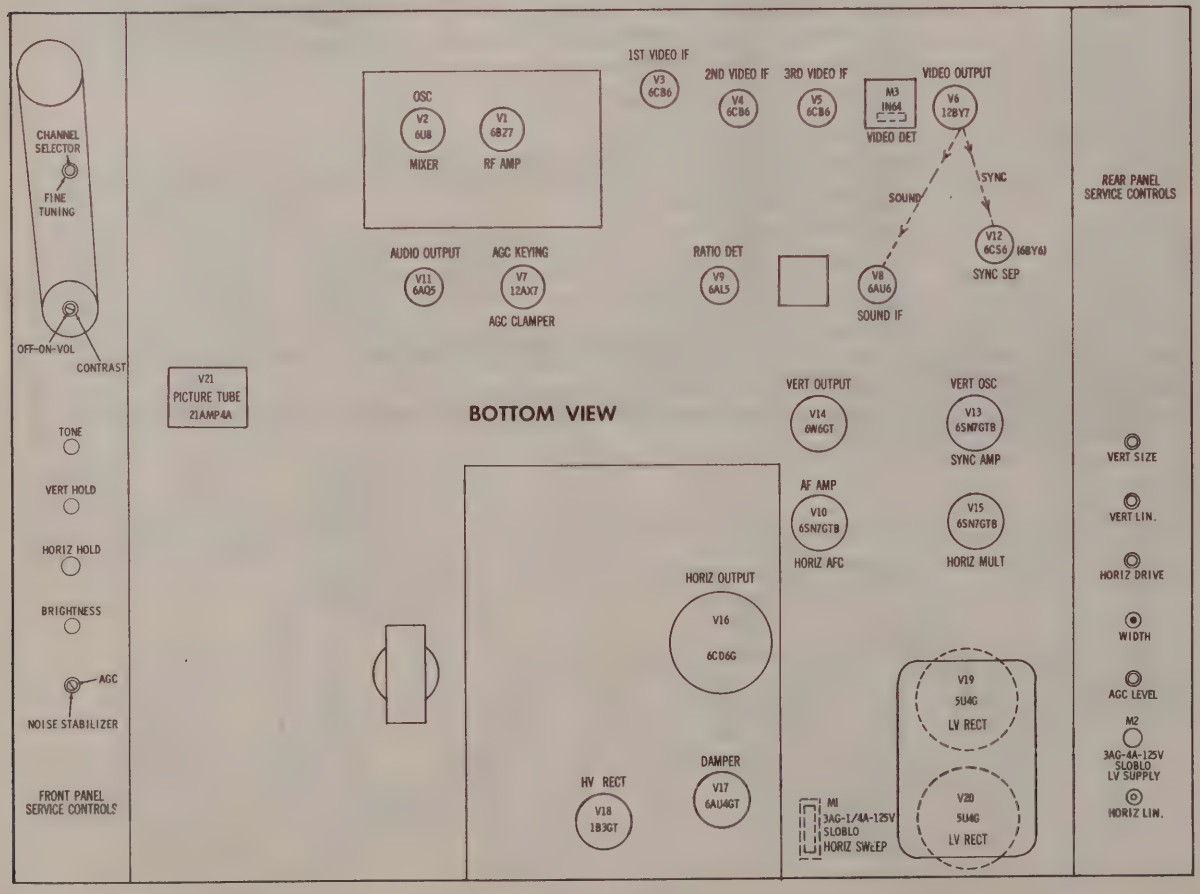


FIG. 5

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	† 3KΩ	300KΩ	INF	0Ω	. 1Ω	INF	1. 5Meg	0Ω	0Ω
V 2	6U8	† 6KΩ	200KΩ	† 100KΩ	. 1Ω	0Ω	† 2. 5KΩ	0Ω	0Ω	10KΩ
V 3	6CB6	100KΩ	47Ω	0Ω	. 1Ω	† 3. 2KΩ	† 3. 2KΩ	0Ω		
V 4	6CB6	100KΩ	56Ω	0Ω	. 1Ω	† 3. 2KΩ	† 3. 2KΩ	0Ω		
V 5	6CB6	. 1Ω	120Ω	0Ω	. 1Ω	† 3. 2KΩ	† 3. 2KΩ	0Ω		
V 6	12BY7	22Ω	4. 7KΩ	22Ω	0Ω	0Ω	. 1Ω	† 5KΩ	† 18KΩ	22Ω
V 7	12AX7	1. 5Meg	1. 5Meg	0Ω	0Ω	0Ω	450KΩ	4. 7KΩ	30KΩ	. 1Ω
V 8	6AU6	3. 2Ω	180Ω	0Ω	. 1Ω	† 12KΩ	† 12KΩ	180Ω		
V 9	6AL5	INF	INF	0Ω	. 1Ω	10KΩ	0Ω	10KΩ		
V 10	6SN7GTA	400KΩ	† 47KΩ	2. 2KΩ	350KΩ	17KΩ	100KΩ	0Ω	. 1Ω	
V 11	6AQ5	560KΩ	330Ω	0Ω	. 1Ω	† 850Ω	† 400Ω	560KΩ		
V 12	6CS6	35KΩ	0Ω	. 1Ω	0Ω	† 100KΩ	† 33KΩ	3. 3Meg		
V 13	6SN7GTB	420KΩ	▲ 2. 5Meg	210Ω	33KΩ	† 12KΩ	2. 2KΩ	0Ω	. 1Ω	
V 14	6W6GT	TP	. 1Ω	† 1KΩ	† 1. 5KΩ	2. 2Meg	TP	0Ω	850Ω	
V 15	6SN7GTB	5Meg	† 5. 6KΩ	1. 2KΩ	150KΩ	† 120KΩ	1. 2KΩ	0Ω	. 1Ω	
V 16	6CD6G	TP	. 1Ω	0Ω	TP	1Meg	TP	0Ω	† 9KΩ	TOP CAP ▲ 6Ω
V 17	6AU4GT	TP	NC	1Meg	NC	† 75Ω	TP	. 1Ω	0Ω	
V 18	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 240Ω
V 19	5U4G	INF	30KΩ	INF	15Ω	INF	14Ω	INF	30KΩ	
V 20	5U4G	TP	30KΩ	INF	15Ω	INF	14Ω	INF	30KΩ	
V 21	21AMP4A	0Ω	80KΩ	PIN 10 ▲ 440KΩ	PIN 11 † 330KΩ	PIN 12 . 1Ω				

† MEASURED FROM PIN 2 OF V19.
▲ MEASURED FROM PIN 3 OF V17.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART

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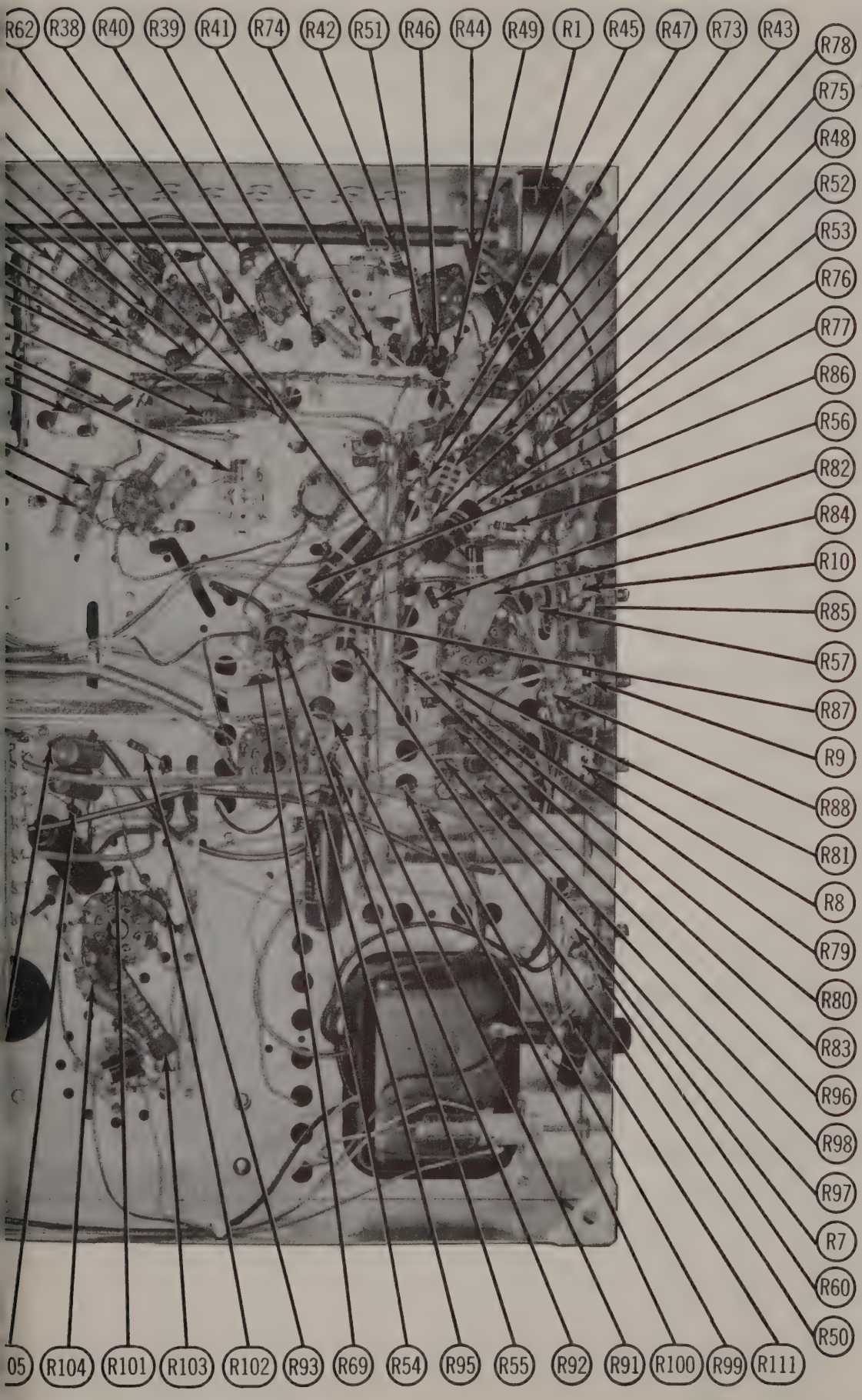
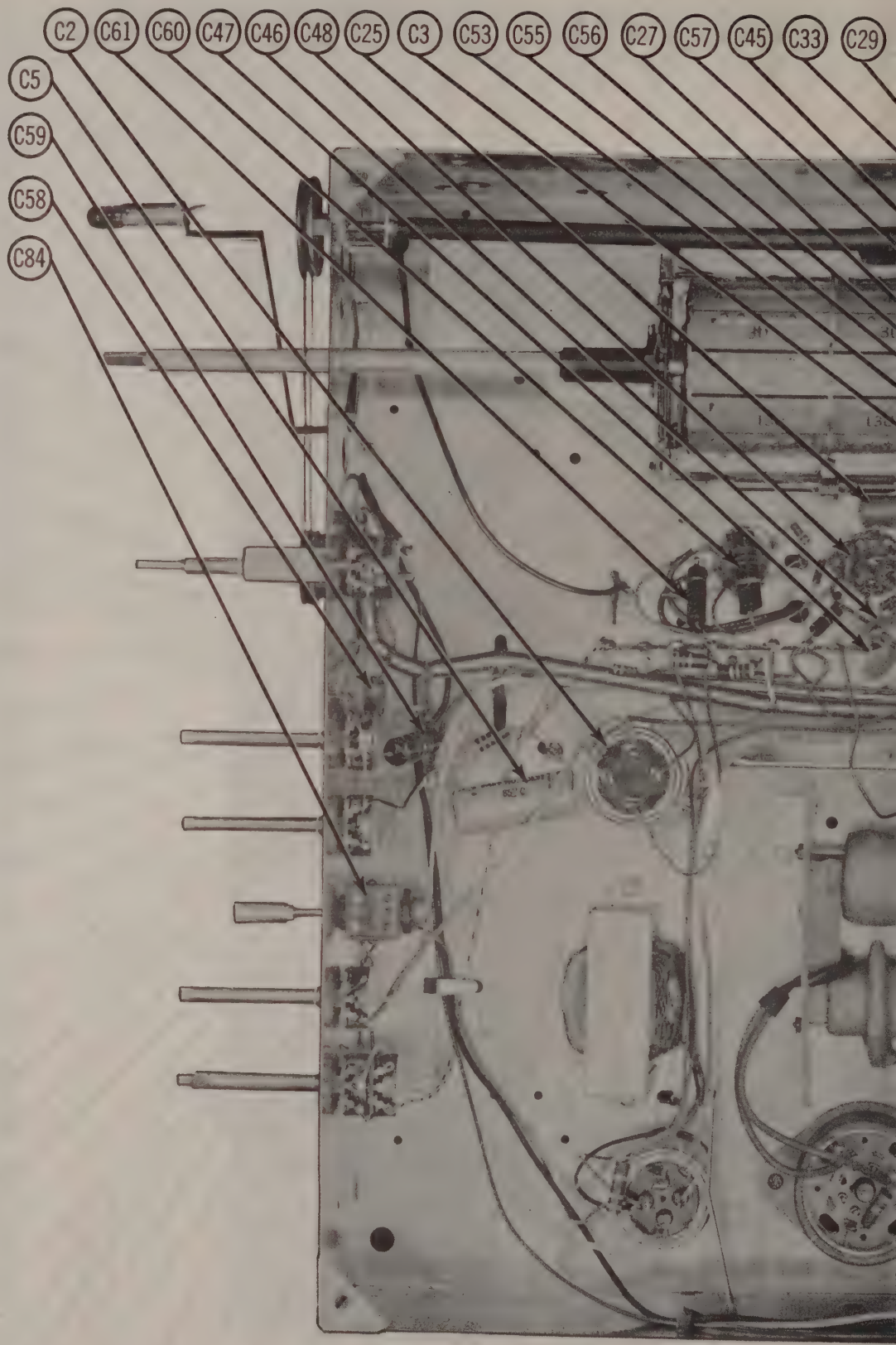
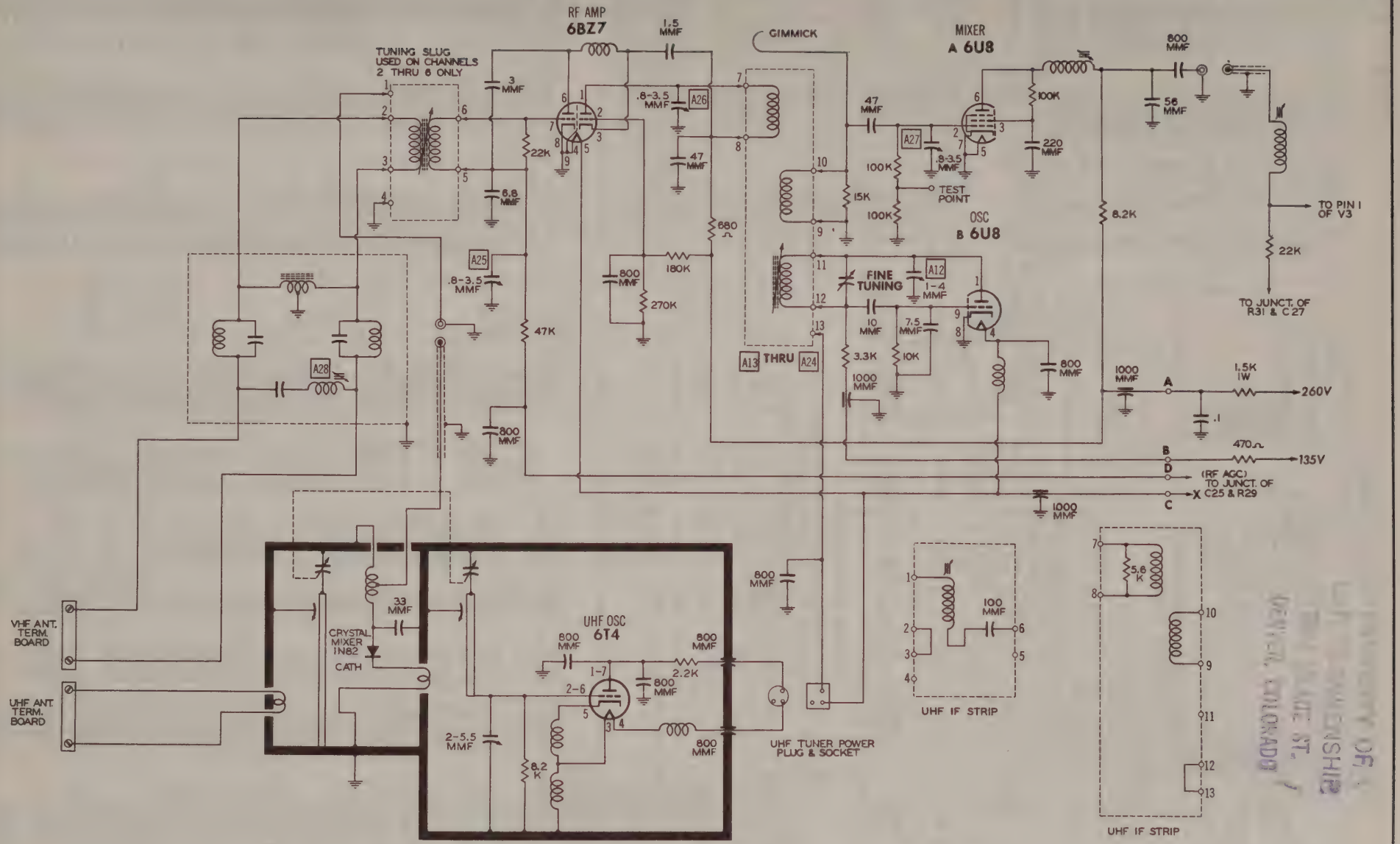


ESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-C



UHF-VHF TUNER PART NO. 20E976 USED WITH UHF MODELS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF-VHF TUNER SCHEMATIC

SENTINEL MODELS 1U-1202C, 1U-1205C, 1U-1208, 1U-1212, 1U-1215, 1U-1218 (Series A, B)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BZ7	
V2	Mixer-Oscillator	6U8	
V3	1st. Video IF Amplifier	6CB6	
V4	2nd. Video IF Amplifier	6CB6	
V5	3rd. Video IF Amplifier	6CB6	
V6	Video Output	12BY7	
V7	AGC Keying-AGC Clamper	12AX7	
V8	Sound IF Amplifier	6AU6	
V9	Ratio Detector	6AL5	
V10	AF Amplifier-Horiz.AFC	6SN7GTA	
V11	Audio Output	6AQ5	
V12	Sync Separator	6CS6	Note 1
V13	Sync Amplifier-Vert. Oscillator	6SN7GTB	
V14	Vert. Output	6W6GT	
V15	Horiz. Mult.	6SN7GTB	
V16	Horiz. Output	6CD6G	
V17	Damper	6AU4GT	
V18	HV Rectifier	1B3GT	
V19	LV Rectifier	5U4G	
V20	LV Rectifier	5U4G	

Note 1. 6BY6 may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	SENTINEL PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V21	21AMP4A	21AMP4A	21ACP4A/ 21AMP4A ①	21AMP4A ②	① Aluminized ② Silver screen "85"
		21AMP4	21ACP4/21AMP4		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SENTINEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	350	25E92	E4D892	C089	FP333.2	TM-Q40-450	Q-065	R2214 *
B	■80	350			BR4035	TC78	TD-100-50	MTH-5010	
C	▲40	350							
D	100	50							
C2A	■10	350	25E93	AFH4-18	D017	FP343.6	TM-4053	Q-060	R4822 *
B	▲40	350				TC60			
C	▲20	350							
D	5	350							
C3	10	50	25E66	PR850V10	BR105	TC32	TD-10-50	FM-0510	TVA-1304
C4	10	50	25E66	PR850V10	BR105	TC32	TD-10-50	FM-0510	TVA-1304
C5	50	50	25E91	PR850V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308

* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	1000		CD8X-102Z	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C7	3-9		31A-056-2		829-10					
C8	.5-3				829-3		3139-01-0R5	CT565A		
C9	3		13L8C030K	NP0-DI3	TCZ-3R3	Z007	NP0A-030	ZT-553	5TCCB-V33	
C10	800		13M28N1027-03							
C11	1.5		13L8C1R5C	NP0-SI1.5	TCZ-1R5	Z004	NP0A-1R5	ZT-5515	5TCCB-V15	
C12	47		13L8Q470K							
C13	47		13M20U470K-R	N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C14	.5-3		31A-056-1		829-3		3139-01-0R5	CT565A		
C15	10		13L8T100A							
C16	5		13L8UA050C							
C17	.5-3		31A-056-1		829-3		3139-01-0R5	CT565A		
C18	1000		CD8X-102Z	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C19	800		13M-28N1027-03							
C20	800		13M-28N1027-03							
C21	800		13M-28N1027-03							
C22	220		13L12D221K	NP0-SI220	DD-221	TZ38	811-221		5TCC-T22	
C23	68		13L12U680H	N750-DI68	TCN-68	N038	N750L-680		5TCU-Q68	
C24	470		23E2027-14	DI-00047	DD-471	TN38	811-471	UC-5347	5GA-T47	
C25	.1	200	23E3216	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C26	1.0	100	23E2043	P288N-1.0		CUB2W1		PT41	2TM-M1	
C27	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C28	10		23E4001-3	NP0-SI10	TCZ-10	Z018	NP0A-100	ZT-541	5TCC-Q1	Note 1
C29	470		23E4000-26	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C30	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	15			NP0-SI15	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C32	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C33	470		23E4000-26	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C34	1		23E4001-32	NP0-SI1	TCZ-1	TZ03	NP0A-010		5TCCB-V1	
C35	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	15			NP0-SI15	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C37	560	500	23E3500-41	1467-00056	D6-561	1W5T56	811-561	UC-5356	1FM-356	
C38	680		23E3500-28	SI68	D6-681	1W5T68	811-681	UC-5368	5GA-T68	
C39	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C40	30		23E4001-9		TCZ-30	TZ17	NP0L-300			
C41	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C42	.01	400	23E3410	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C43	.1	400	23E3416	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C44	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C45	.1	400	23E3416	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C46	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C47	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C48	10000		23E4004-17	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C49	2		23E4001-7	NP0-SI2.2	TCZ-2R2	Z005	NP0A-2R2		5TCCB-V22	
C50	20		23E4001-8	NP0-SI20	TCZ-20	TZ13	NP0K-200	ZT-542	5TCC-Q2	
C51	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C52	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C53	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C54	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C55	470	500	23E3500-40	1468-00047	D6-471	5W5T47	811-471	UC-5347	1FM-347	
C56	1000		23E4000-30	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C57	10000		23E4004-17	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C58	.0033	400	23E3407	BPD-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C59	.039	400	23E3423	P288N-04		CUB684		PT614	4TM-84	
C60	.022	400	23E3412	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C61	.001	600	23E3604	BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C62	1.0	100	23E2043	P288N-1.0		CUB2W1		PT41	2TM-M1	Note 2
C63	1.0	100	23E2043	P288N-1.0		CUB2W1		PT41	2TM-M1	Note 2
C64	470		23E4000-26	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C65	.0047	400	23E3408	BPD-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C66	.047	400	23E3414	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C67A	10000		†23E2023-8	†PA-480	†PC-106	K082	811-01	DC-511	5HK-S1	
B	5000					K080	811-005	DC-525	5HK-D5	
C68	.01	400	23E3434							
C69	.22	400	23E3418	P488N-22		CUB4P22		PT4022	4TM-P22	
C70	.033	400	23E3413	P488N-033	DF-303	CUB6S33		PT4133	6TM-S33	

ITEM No.	RATING CAP.	RATING VOLT	SENTINEL PART No.	AEROVOX PART No.	CEN PA
C71	.1	200	23E3216	P288N-1	DF-
C72	.1	400	23E3416	P488N-1	DF-
C73	1000		23E4004-5	BPD-001	DD-
C74	.01	400	23E3410	BPD-01	D6-
C75	5000		23E4004-15	BPD-005	DD-
C76	150		23E4000-20	SI150	D6-
C77	470	500	23E3500-40	1464-00047	D6-
C78	1000		23E4004-5	BPD-001	DD-
C79	.0022	400	23E3406	BPD-0022	D6-
C80	1000		23E4004-5	BPD-001	DD-
C81	.01	400	23E3410	BPD-01	D6-
C82	390	500	23E3500-39		D6-
C83	470	500	23E3500-40	1464-00047	D6-
C84	3900	500	23E4005-64	1464-0039	
C85	5000		23E4004-15	BPD-005	DD-
C86	.047	400	23E3414	BPD-05	DF-
C87	.047	400	23E3414	BPD-05	DF-
C88	.047	400	23E3414	BPD-05	DF-
C89	.22	400	23E3418	P488N-22	
C90	120	2000	23E4003-3		DD
C91	5000		23E4004-15	BPD-005	DD-
C92	.01	600	23E3610	BPD-01	D6-
C93	.01	600	23E3610	BPD-01	D6-

† Items C67A, C67B, R84A and R84B are combined in on
Note 1. Not used in some versions.
Note 2. When C62 is a 2MFD unit (part #23E2043-22), it

C

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLAC SENTINEL PART No.	CENTRALAB PART No.	C P
R1A	4000Ω	4	28E150		A1
B	Shaft		Not Req.		KS
R2	■ 1Meg	½	28E151		
R3A	500KΩ	½	28E152	AB-59	A4
B	Shaft		Not Req.	AK-4	KS
R4A	850KΩ with 250K stop	½	28E111	♦ AB-59	♦A
B	Shaft		Not Req.	AK-4	KS
R5	5Meg	½	28E109		
R6A	7. 5Meg	½	28E162		RT
B	1Meg	½			
R7A	10KΩ	½	28E154	AB-14	A4
B	Shaft		Not Req.	AK-4	KS
R8A	15KΩ	½	28E159	AB-20	A4
B	Shaft		Not Req.	AK-4	KS
R9A	2000Ω	½	28E116	AB-6	A4
B	Shaft		Not Req.	AK-4	KS
R10A	5Meg with 1Meg stop	½	28E110	† AB-86	† A
B	Shaft		Not Req.	AK-4	KS

♦ Connect a 240KΩ resistor in series with the right han of the original control (control viewed from shaft end,
† Connect a 1Meg resistor in series with the right hand of the original control (control viewed from shaft end,
* Concentrikit Equivalent, K-2 Kit, Base Elements and

■ Tapped at 200KΩ.

R

All wattages 1/2 watt,

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SENTINEL PART No.	IRC PART No.	NO
R11	47KΩ		27E473K-½	BTS-47K	
R12	22KΩ		27E223K-½	BTS-22K	
R13	820KΩ		27E824K-½	BTS-820K	
R14	470KΩ		27E474K-½	BTS-470K	
R15	1500Ω	1	27E152K-1	BTA-1500	
R16	10KΩ		27E103K-½		
R17	3300Ω		27E332K-½		
R18	6800Ω		27E682K-½		
R19	100KΩ		27E104K-½		
R20	100KΩ		27E104K-½		
R21	100KΩ		27E104K-½		
R22	1000Ω		27E102K-½		
R23	470Ω		27E471K-½	BTS-470	
R24	1500Ω	1	27E152K-1	BTA-1500	
R25	100KΩ 5%		27E104J-½	BTS-100K 5%	
R26	330KΩ 5%		27E334J-½	BTS-330K 5%	
R27	47KΩ		27E473K-½	BTS-47K	
R28	220KΩ		27E224K-½	BTS-220K	
R29	10Meg 5%		27E106J-½	BTS-10Meg 5%	
R30	2200Ω		27E222K-½		
R31	1000Ω		27E102K-½	BTS-1000	
R32	1000Ω		27E102K-½	BTS-1000	
R33	47Ω		27E470K-½	BTS-47	
R34	1000Ω		27E102K-½	BTS-1000	
R35	18KΩ		27E183K-½		
R36	1000Ω		27E102K-½	BTS-1000	
R37	56Ω		27E560K-½	BTS-56	
R38	18KΩ		27E183K-½		
R39	1000Ω		27E102K-½	BTS-1000	
R40	120Ω		27E121K-½	BTS-120	
R41	4700Ω 5%		27E472J-½	BTS-4700 5%	
R42	33KΩ		27E333K-½	BTS-33K	
R43	15KΩ		27E153K-½	BTS-15K	
R44	1000Ω	1	27E102K-1	BTA-1000	
R45	100KΩ		27E104K-½	BTS-100K	
R46	100KΩ		27E104K-½	BTS-100K	
R47	33KΩ		27E333K-½	BTS-33K	
R48	47KΩ		27E473K-½	BTS-47K	
R49	270Ω		27E271K-½	BTS-270	
R50	22KΩ	2	27E223K-2	BTB-22K	
R51	22Ω		27E220K-½	BTS-22	
R52	3300Ω 5%		27E332K-½	BTS-3300	No
R53	100KΩ		27E104K-½	BTS-100K	
R54	68KΩ		27E683K-½	BTS-68K	
R55	10KΩ		27E103K-½	BTS-10K	
R56	560KΩ		27E564K-½	BTS-560K	

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BZ7	
V2	Mixer-Oscillator	6U8	
V3	1st. Video IF Amplifier	6CB6	
V4	2nd. Video IF Amplifier	6CB6	
V5	3rd. Video IF Amplifier	6CB6	
V6	Video Output	12BY7	
V7	AGC Keying-AGC Clamper	12AX7	
V8	Sound IF Amplifier	6AU6	
V9	Ratio Detector	6AL5	
V10	AF Amplifier-Horiz.AFC	6SN7GTA	
V11	Audio Output	6AQ6	

ITEM No	USE	TYPE	NOTES
V12	Sync Separator	6CS6	Note 1
V13	Sync Amplifier-Vert. Oscillator	6SN7GTB	
V14	Vert. Output	6W6GT	
V15	Horiz. Mult.	6SN7GTB	
V16	Horiz. Output	6CD6G	
V17	Damper	6AU4GT	
V18	HV Rectifier	1B3GT	
V19	LV Rectifier	5U4G	
V20	LV Rectifier	5U4G	

Note 1. 6BY6 may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: SENTINEL PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V21	21AMP4A	21ACP4A	21ACP4A / 21AMP4A ①	21AMP4A	① Aluminized ② Silver screen "85"
		21AMP4	21ACP4, 21AMP4		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	SENTINEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	350	35E92	E4D892	C089	FP333.2	TM-Q40-450	Q-065	R2214 *
B	80	350			BR4035	TC78	TD-100-50	MTE-5010	
C	40	350							
D	100	50							
C2A	10	350	35E93	AF24-12	D017	FP343.6	TM-4053	Q-060	R4822 *
B	40	350				TC80			
C	30	350							
D	5	350							
C3	10	50	35E66	PRS50V10	BR105	TC32	TD-10-50	FM-0510	TVA-1304
C4	10	50	35E66	PRS50V10	BR105	TC32	TD-10-50	FM-0510	TVA-1304
C5	50	50	35E91	PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308

* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	1000		CD6X-102Z	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C7	3-9		31A-056-2		829-10					
C8	.5-3				829-3		3139-01-0R5	CT585A		
C9	3		13L8C030K	NP0-DI3	TCZ-3R3	Z007	NP0A-030	ZT-553	5TCCB-V33	
C10	300		13M2N1027-03							
C11	1.5		13L8C1R5C	NP0-SI1.5	TCZ-1R5	Z084	NP0A-1R5	ZT-5515	5TCCB-V15	
C12	47		13L8Q470K							
C13	47		13M30U470K-R	N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C14	.5-3		31A-056-1		829-3		3139-01-0R5	CT585A		
C15	10		13L8T100A							
C16	5		13L8UA050C							
C17	.5-3		31A-056-1		829-3		3139-01-0R5	CT585A		
C18	1000		CD6X-102Z	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C19	300		13M-28N1027-03							
C20	300		13M-28N1027-03							
C21	300		13M-28N1027-03							
C22	220		13L12D22K	NP0-SI220	DD-221	TZ38	SII-221		5TCC-T22	
C23	68		13L12U680H	N750-DI68	TCN-68	N038	N750L-680		5TCU-Q68	
C24	470		23E2037-14	DI-00047	DD-471	TN38	SII-471	UC-5347	5GA-T47	
C25	.1	200	23E3218	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C26	1.0	100	23E3043	P288N-1.0		CUB2W1		PT41	2TM-M1	
C27	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C28	10		23E4001-3	NP0-SI10	TCZ-10	Z018	NP0A-100	ZT-541	5TCC-Q1	Note 1
C29	470		23E4000-26	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C30	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	15			NP0-SI15	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C32	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C33	470		23E4000-26	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C34	1		23E4001-33	NP0-SI1	TCZ-1	TZ03	NP0A-010		5TCCB-V1	
C35	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	15			NP0-SI15	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C37	560	500	23E3500-41	1467-00056	D6-561	1W5T56	SII-561	UC-5356	1FM-356	
C38	680		23E3500-26	SI68	D6-681	1W5T68	SII-681	UC-5368	5GA-T68	
C39	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C40	30		23E4001-9		TCZ-30	TZ17	NP0L-300			
C41	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C42	.01	400	23E3410	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C43	.1	400	23E3416	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C44	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C45	.1	400	23E3416	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C46	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C47	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C48	10000		23E4004-17	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C49	2		23E4001-7	NP0-SI2.2	TCZ-2R2	Z005	NP0A-2R2		5TCCB-V22	
C50	20		23E4001-8	NP0-SI20	TCZ-20	TZ13	NP0K-200	ZT-542	5TCC-Q2	
C51	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C52	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C53	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C54	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C55	470	500	23E3500-40	1468-00047	D6-471	5W5T47	SII-471	UC-5347	1FM-347	
C56	1000		23E4000-30	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C57	10000		23E4004-17	BPD-01	DD-103	K082	SII-01	DC-511	5HK-S1	
C58	.0033	400	23E3407	BPD-0033	D6-332	CUB6D33	GP3-333-332	PT6233	6TM-D33	
C59	.039	400	23E3423	P288N-04		CUB684		PT614	4TM-64	
C60	.022	400	23E3412	BPD-02	DF-203	CUB4S22	SII-02	PT4122	4TM-S22	
C61	.001	600	23E3604	BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C62	1.0	100	23E3043	P288N-1.0		CUB2W1		PT41	2TM-M1	Note 2
C63	1.0	100	23E3043	P288N-1.0		CUB2W1		PT41	2TM-M1	Note 2
C64	470		23E4000-26	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C65	.0047	400	23E3408	BPD-0047	D6-472	CUB6D47	GP3-333-473	PT6247	6TM-D47	
C66	.047	400	23E3414	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C67A	10000		†33E3023-8	†PA-480	†PC-106	K082	SII-01	DC-511	5HK-S1	
B	5000					K080	811-005	DC-525	5HK-D5	
C68	.01	400	23E3424							
C69	.22	400	23E3418	P488N-22		CUB4P22		PT4022	4TM-P22	
C70	.033	400	23E3412	P488N-033	DF-303	CUB6S33		PT4133	6TM-S33	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C71	.1	200	23E3218	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C72	.1	400	23E3418	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C73	3300		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C74	.01	400	23E3410	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C75	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C76	150		23E4000-30	SI150	D6-151	TP36	GP2K-151	UC-5315	5GA-T15	
C77	470	500	23E3500-40	1464-00047	D6-471	5R5T47	SII-471	MCL347	MS-347	
C78	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C79	.0022	400	23E3406	BPD-0022	D6-222	CUB6D22	GP2-333-223	PT6223	6TM-D22	
C80	1000		23E4004-5	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C81	.01	400	23E3410	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C82	390	500	23E3500-39			5R5T39	SII-391	MCL339	MS-339	
C83	470	500	23E3500-40	1464-00047	D6-471	5R5T47	SII-471	MCL347	MS-347	
C84	3900	500	23E4005-64	1464-0039		1R5D39			MS-239	
C85	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C86	.047	400	23E3414	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C87	.047	400	23E3414	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C88	.047	400	23E3414	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C89	.22	400	23E3418	P488N-22		CUB4P22		PT4022	4TM-P22	
C90	120	2000	23E4003-3		DD30-121				30GA-T12	
C91	5000		23E4004-15	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C92	.01	600	23E3610	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C93	.01	600	23E3610	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	

† Items C67A, C67B, R84A and R84B are combined in one unit.
Note 1. Not used in some versions.
Note 2. When C62 is a 1MFD unit (part #23E2043-22), item C63 is not used.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	SENTINEL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	4000Ω	4	28E150		A10-4000	WP6-4000	M4MPK	Contrast-Wire Wound
B	Shaft		Not Req.		KSS-3	C3	Not Req.	Attach to R1A.
R2	1Meg	½	28E151					Volume & Switch
R3A	500KΩ	½	28E152	AB-50	A47-500K-S	Q11-133	U-50	Tone
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A.
R4A	850KΩ with 250K stop	½	28E111	◇ AB-50	◇A47-1Meg-S	◇ Q11-134	◇ U-54	Vert. Hold
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R4A.
R5	5Meg	½	28E109			Q17-141		Brightness
R6A	7. 5Meg	½	28E162		RTV-578	◇ QJ-1001	UF106L	Noise Stabilizer (Panel)
B	1Meg	½					UR16L	Locality Signal Adjust (Rear)
R7A	10KΩ	½	28E154	AB-14	A47-10K-S	Q11-116	TA14L	AGC Level
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R7A.
R8A	15KΩ	½	28E159	AB-20	A47-15K-S	QJ1-119	TA15L	Horiz. Drive
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R8A.
R9A	2000Ω	½	28E116	AB-6	A47-2000-S	Q11-110	U-6	Vert. Linearity
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R9A.
R10A	5Meg with 1Meg stop	½	28E110	† AB-86	† A47-4Meg-S	† Q11-141	† U-67	Vert. Size
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R10A.

◇ Connect a 240KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
† Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
◇ Concentrikit Equivalent, K-2 Kit, Base Elements and Shafts: B11-142 & P9-109 (Panel)
B11-137 & R11-216 (Rear)
≡ Tapped at 200KΩ.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	SENTINEL PART No.	IRC PART No.	NOTES
R11	47KΩ		27E473K-½	BTS-47K	
R12	22KΩ		27E223K-½	BTS-22K	
R13	620KΩ		27E624K-½	BTS-620K	
R14	470KΩ		27E474K-½	BTS-470K	
R15	1500Ω	1	27E152K-1	BTA-1500	
R16	10KΩ		27E103K-½		
R17	3300Ω		27E332K-½		
R18	6800Ω		27E682K-½		
R19	100KΩ		27E104K-½		
R20	100KΩ		27E104K-½		
R21	100KΩ		27E104K-½		
R22	1000Ω		27E102K-½		
R23	470Ω		27E471K-½	BTS-470	
R24	1500Ω	1	27E152K-1	BTA-1500	
R25	100KΩ 5%		27E1047-½	BTS-100K 5%	
R26	330KΩ 5%		27E3347-½	BTS-330K 5%	
R27	47KΩ		27E473K-½	BTS-47K	
R28	220KΩ		27E224K-½	BTS-220K	
R29	10Meg 5%		27E1067-½	BTS-10Meg 5%	
R30	2200Ω		27E222K-½		
R31	1000Ω		27E102K-½	BTS-1000	
R32	1000Ω		27E102K-½	BTS-1000	
R33	47Ω		27E470K-½	BTS-47	
R34	1000Ω		27E102K-½	BTS-1000	
R35	18KΩ		27E183K-½		
R36	1000Ω		27E102K-½	BTS-1000	
R37	56Ω		27E560K-½	BTS-56	
R38	18KΩ		27E183K-½		
R39	1000Ω		27E102K-½	BTS-1000	
R40	120Ω		27E121K-½	BTS-120	
R41	4700Ω	5%	27E472J-½	BTS-4700 5%	
R42	33KΩ		27E333K-½	BTS-33K	
R43	15KΩ		27E153K-½	BTS-15K	
R44	1000Ω	1	27E102K-1	BTA-1000	
R45	100KΩ		27E104K-½	BTS-100K	
R46	100KΩ		27E104K-½	BTS-100K	
R47	33KΩ		27E333K-½	BTS-33K	
R48	47KΩ		27E473K-½	BTS-47K	
R49	270Ω		27E271K-½	BTS-270	
R50	22KΩ	2	27E223K-2	BTB-22K	
R51	22Ω		27E220K-½	BTS-22	
R52	3300Ω 5%		27E332K-½	BTS-3300	Note 1
R53	100KΩ		27E104K-½	BTS-100K	
R54	68KΩ		27E683K-½	BTS-68K	
R55	10KΩ		27E103K-½	BTS-10K	
R56	560KΩ		27E564K-½	BTS-560K	

ITEM No.	RATING: OHMS	WATT	SENTINEL PART No.	IRC PART No.	NOTES
R57	220KΩ		27E224K-½	BTS-220K	
R58	4700Ω		27E472K-½	BTS-4700	
R59	150KΩ	1	27E154K-1	BTA-150K	
R60	4700Ω		27E472K-½	BTS-4700	
R61	10KΩ		27E103K-½	BTS-10K	
R62	180Ω		27E181K-½	BTS-180	
R63	470Ω		27E471K-½	BTS-470	
R64	33KΩ		27E333K-½	BTS-33K	
R65	10KΩ 5%		27E103J-½	BTS-10K 5%	
R66	10KΩ 5%		27E103J-½	BTS-10K 5%	
R67	68KΩ		27E683K-½	BTS-68K	
R68	47KΩ	1	27E473K-1	BTA-47K	
R69	2200Ω		27E222K-½	BTS-2200	
R70	330Ω	1	27E331K-1	BTA-330	
R71	560KΩ		27E564K-½	BTS-560K	
R72	330Ω	1	27E331K-1	BTA-330	
R73	220KΩ		27E224K-½	BTS-220K	
R74	560KΩ		27E564K-½	BTS-560K	
R75	3.3Meg		27E335K-½	BTS-3.3Meg	
R76	560KΩ		27E564K-½	BTS-560K	
R77	100KΩ		27E104K-½	BTS-100K	
R78	33KΩ	2	27E333K-2	BTB-33K	
R79	560KΩ		27E564K-½	BTS-560K	
R80	33KΩ		27E335K-½	BTS-33K	
R81	10KΩ		27E103K-½	BTS-10K	
R82	2200Ω		27E222K-½	BTS-2200	
R83	4700Ω		27E472K-½	BTS-4700	
R84A	22KΩ		† 23E2023-8	BTS-22 K	
B	10KΩ			BTS-10K	
R85	10KΩ		27E103K-½	BTS-10K	
R86	2.2Meg		27E225M-½	BTS-2.2Meg	
R87	470Ω		27E471K-½	BTS-470	
R88	470Ω	1	27E471K-1	BTA-470	
R89	680Ω		27E681K-½		
R90	680Ω		27E681K-½		
R91	100KΩ		27E104K-½	BTS-100K	
R92	150KΩ		27E154K-½		
R93	33KΩ		27E333K-½		
R94	39KΩ		27E393K-½		
R95	100KΩ		27E104K-½	BTS-100K	
R96	4.7Meg		27E475M-½		
R97	5600Ω 5%		27E5627-½		
R98	1200Ω		27E122K-½		
R99	150KΩ		27E154K-½		
R100	120KΩ		27E124K-½		
R101	1Meg		27E105K-½		

RESISTORS (cont)

ITEM No	RATING: OHMS	WATT	SENTINEL PART No	IRC PART No.	NOTES
R102	120Ω		27E121K-½	BW½-8.2	
R103	8700Ω	5	27E1016-20		
R104	120Ω		27E121K-½		
R105	220KΩ		27E224K-½	BTS-220K	
R106	1000Ω		27E102K-½		

ITEM No	RATING: OHMS	WATT	SENTINEL PART No	IRC PART No.	NOTES
R107	8.2Ω		27E1015-10	BW½-8.2	
R108	470Ω	1	27E471K-1	BTA-470	
R109	2200Ω	10	27E1016-30	1 3/4A-2250	
R110	10Ω		27E100K-½	BTS-10	Note 2
R111	220KΩ		27E224K-½	BTS-220K	

Note 1. Not used in series "A" chassis.
Note 2. Series "A" chassis use a 22Ω 1W resistor in this application (Part No. 27E220K-1).
† Items R84A, R84B, C67A, C67B are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: SENTINEL PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC	525VCT @ 2.2A	5V @ 320A	6.3V @ 6A	22E104		P2839 ①		26R34 ②	
				@ 1.5A						

① Tape 6.3V @ 3.6A winding.
② Parallel and phase 6.3V windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	SENTINEL PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Osc. Trans.	22E89-3	B6704	A-3006		V405 ①	A-8125 ①	26A05	A-97X ①
T3	Horiz. Output Trans.	20E948	FB419 *	HVO-38 *	2357I & 2148I * ③	X094 * ③	A-8253 *	FLY-16 ④	D-50 & WC-20 * ③
T4	Vert. Output Trans.	22E90	Z1900 @	A-2823 @		V307 @	A-8142 @	26S72 @	A-108X @
T5A	Yoke(90°)	20E932-2 ⑤	DF606 @	MDF-91 @	237D1 @	Y90F12/47 @	DY-13A @	Y-14 @	Y-40-1 @
B	Horiz.(12MH)								
	Vert.(30MH)								
T6	Width Coil(.8-7MH)	20E1170		MWC-8 @	21IR1 @	201R15 @	WC-8 @	WC-22 @	WC-12 @
T7	Linearity Coil (1.5-6.7MH)	20E820	RF800 @	MWC-8 @	21IR1 @	201R15 @	WC-8 @	WC-22 @	WC-12 @

① Connect blue and red in cathode circuit, yellow and green in grid circuit. Reverse either winding if necessary.
② Includes resistors R89, R90, and R106 and capacitor C90.
③ Drill new mounting hole(s).
④ Use 8 to 1 turns ratio.
⑤ Connect as auto transformer.
⑥ Connect horizontal damping network across yoke terminals 3 and 7.
⑦ Use original horizontal damping network if necessary.
⑧ Use blue and green terminals.
⑨ Use terminals 3 and 4.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	9	9	9	9	8	9	9
	7	7	7	7	7	1	7	7
	6	5	5	7	5	2	5	5
	5	T	T	T	3	3	3	T
	3 & U	1	1	3	1	4	1	3
	2	6	6	Term E" of 214RI	2	7	Term 1 of WC-20	Blk. Term. of WC-11
	1	2	2	Term "D" of 214RI	6	6	Term 2 of WC-20	Org. Term. of WC-11
Connect Width Coil Across		2 & 6	2 & 6	Terms. A & B of 214RI across 1 & 3	2 & 6	6 & 7	Terms 3 & 4 of WC-20 across 3 & 1	Red & Blue Terms. of WC-11 across 3 & 1
Special Notes		⑪	⑪	⑩⑪		⑪	⑩⑪	⑩⑪

⑩ If AGC and AFC Circuits fail to work properly reverse width coil primary or secondary.
⑪ Requires 2 turns of filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI.	SEC.	SENTINEL PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T8	5.5KΩ	3-4Ω	22E103	Z1006	A3019	A3649	26S49	S-5Z	

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C IMP.	SENTINEL PART No.	QUAM PART No	RCA TYPE No	NOTES
SP1	10"	PM	3-4Ω	1E43-4 ①	10A31	256S1	① Used in Models 1U-1205C, 1U-1208, 1U-1215, 1U-1218.
SP2	4"	PM	12Ω	1E66 ②	4A07T	208S2	② Used in Models 1U-1203C, 1U-1212.

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	SEC.	SENTINEL PART No.	MEISSNER PART No	MERIT PART No	MILLER PART No	NOTES
R1A	Ant. Coil	0Ω	0Ω	31M-012-2U				Channel 2
B	Ant. Coil	0Ω	0Ω	31M-012-3U				Channel 3
C	Ant. Coil	0Ω	0Ω	31M-012-4U				Channel 4
D	Ant. Coil	0Ω	0Ω	31M-012-5U				Channel 5
E	Ant. Coil	0Ω	0Ω	31M-012-6U				Channel 6
F	Ant. Coil	0Ω	0Ω	31M-012-7U				Channel 7
G	Ant. Coil	0Ω	0Ω	31M-012-8U				Channel 8
H	Ant. Coil	0Ω	0Ω	31M-012-9U				Channel 9
I	Ant. Coil	0Ω	0Ω	31M-012-10U				Channel 10
J	Ant. Coil	0Ω	0Ω	31M-012-11U				Channel 11
K	Ant. Coil	0Ω	0Ω	31M-012-12U				Channel 12
L	Ant. Coil	0Ω	0Ω	31M-012-13U				Channel 13
L2	Neut. Coil	0Ω		31B-629				
L3A	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-2U				Channel 2
B	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-3U				Channel 3

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SENTINEL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
C	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-4U				Channel 4
D	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-5U				Channel 5
E	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-6U				Channel 6
F	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-7U				Channel 7
G	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-8U				Channel 8
H	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-9U				Channel 9
I	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-10U				Channel 10
J	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-11U				Channel 11
K	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-12U				Channel 12
L	RF, Mixer Grid, Osc. Coils	0Ω		31M-112-13U				Channel 13
L4	Fil. Choke	0Ω		34A-704				
L5	Conv. Plate	.1Ω		31K-109				
L6	1st Video IF	.1Ω		20E857				
L7	2nd Video IF	.1Ω	.1Ω	20E1033			6333	Includes 47.25MC Trap
L8	3rd Video IF	.1Ω	.1Ω	20E1034			6221	Includes 41.25MC Trap
L9	Series Peaking Coil	2.5Ω		20E883	19-1005		4612	12 Microhenries
L10	Shunt Peaking Coil	16Ω		20E363-19	19-4500	TV-128	6136 *	450 Microhenries, Wound on 10Meg resistor
L11	4.5MC Trap	3Ω		20E785	20-1004	TV-151	1469	
L12	Shunt Peaking Coil	11Ω		20E363-25	19-3250	TV-125	6130	270 Microhenries
L13	Series Peaking Coil	6.3Ω		20E363-28	19-3160 *		6120 *	160 Microhenries, Wound on 10Meg resistor-Note L
L14	Sound IF	3.2Ω		20E785	20-1005	TV-151	1469	
L15	Ratio Det.	4Ω	.10CT	20E783	17-1033	TV-110	1468	Tertiary Winding-.4Ω
L16	RF Choke	.4Ω		20E1195				5.5 Microhenries
L17	RF Choke	.3Ω		20E1194	19-1001		4604	1.7 Microhenries

* Parallel with 10Meg resistor.
Note L. Not used in series "A" chassis.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SENTINEL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L18	97Ω		20E831							

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L19	.320ADC	74Ω	2.6HY	22E105	C5037	C2996	C2326 ①	28C44 ①	C-17X

① Drill one new mounting hole.

FUSES

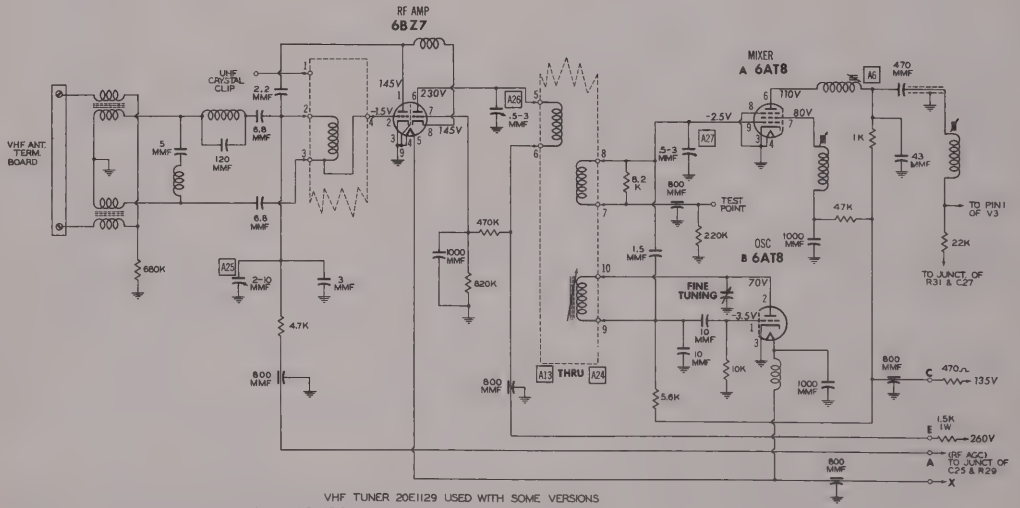
ITEM No.	TYPE	RATING	REPLACEMENT DATA: SENTINEL PART No. FUSE	SENTINEL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	1/4A 125V	40E8-2		313.250 (3AG S/B 1/4A)	357001	MDL 1/4	4405
M2	3AG S/B	4A 125V	40E8-11		313004. (3AG S/B 4A)	342001	MDX4	HKP

CRYSTAL DIODES

ITEM No	ORIG TYPE	REPLACEMENT DATA: SENTINEL PART No.	SYLVANIA PART No.	NOTES
M3	1N64	95E1	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M4	Dial Light	40E2	#44; Not used in some versions
	Dial Light	40E1	#47; Not used in some versions
M5	Tuner	20E950	VHF ("U" Type), VHF Models Only; Not used in some versions
	Tuner	20E1129	VHF ("D" Type), VHF Models Only; Not used in some versions
M6	Tuner	20E976	VHF-UHF Combination, VHF-UHF Models
M7	Trap	31K-225-01	VHF Ant. Input Filter
M8	Video Det. Assy.	20E1167	Includes M3, Coils, & Capacitors
M9	Focus Magnet	62E9-2	Includes Centering Device
M10	Ion Trap	15E174-7	
	Safety Glass	9E45-14	
	Mask	36E105	



VHF TUNER 20E1129 USED WITH SOME VERSIONS

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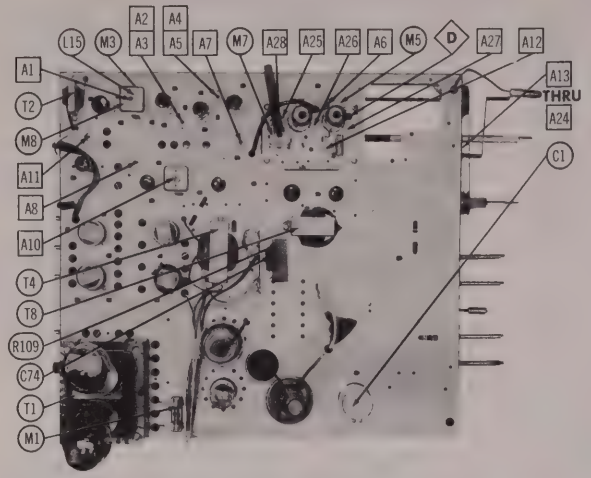
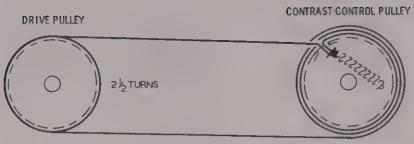
ALTERNATE VHF TUNER SCHEMATIC



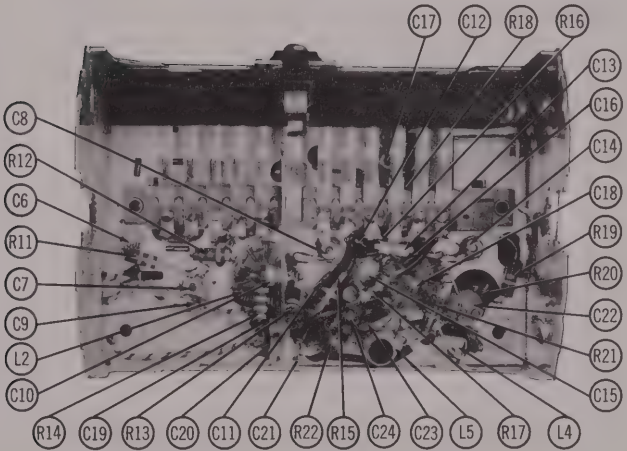
CHASSIS TOP VIEW

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

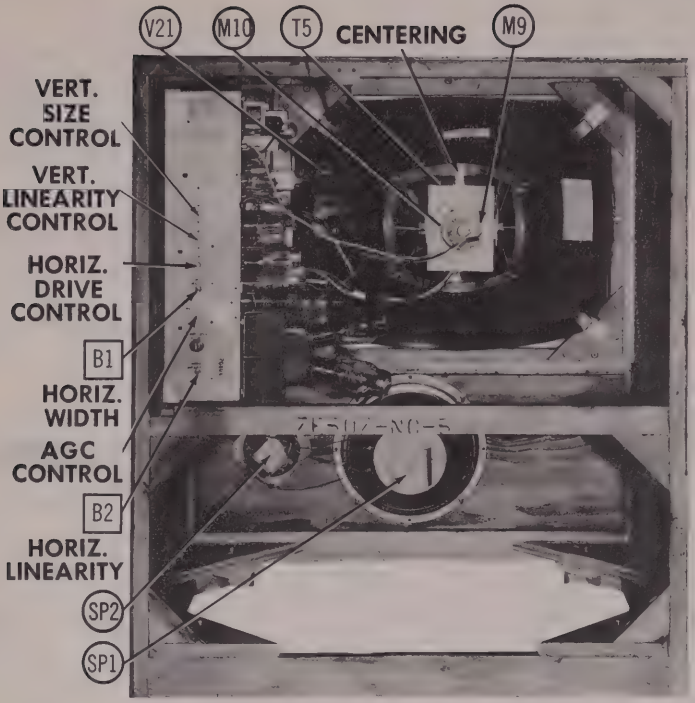


CONTRAST CONTROL PULLEY IN MAX. COUNTER CLOCKWISE POSITION.

DRIVE CORD STRINGING



RF TUNER BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the horizontal hold control adjustment until the picture synchronizes horizontally.

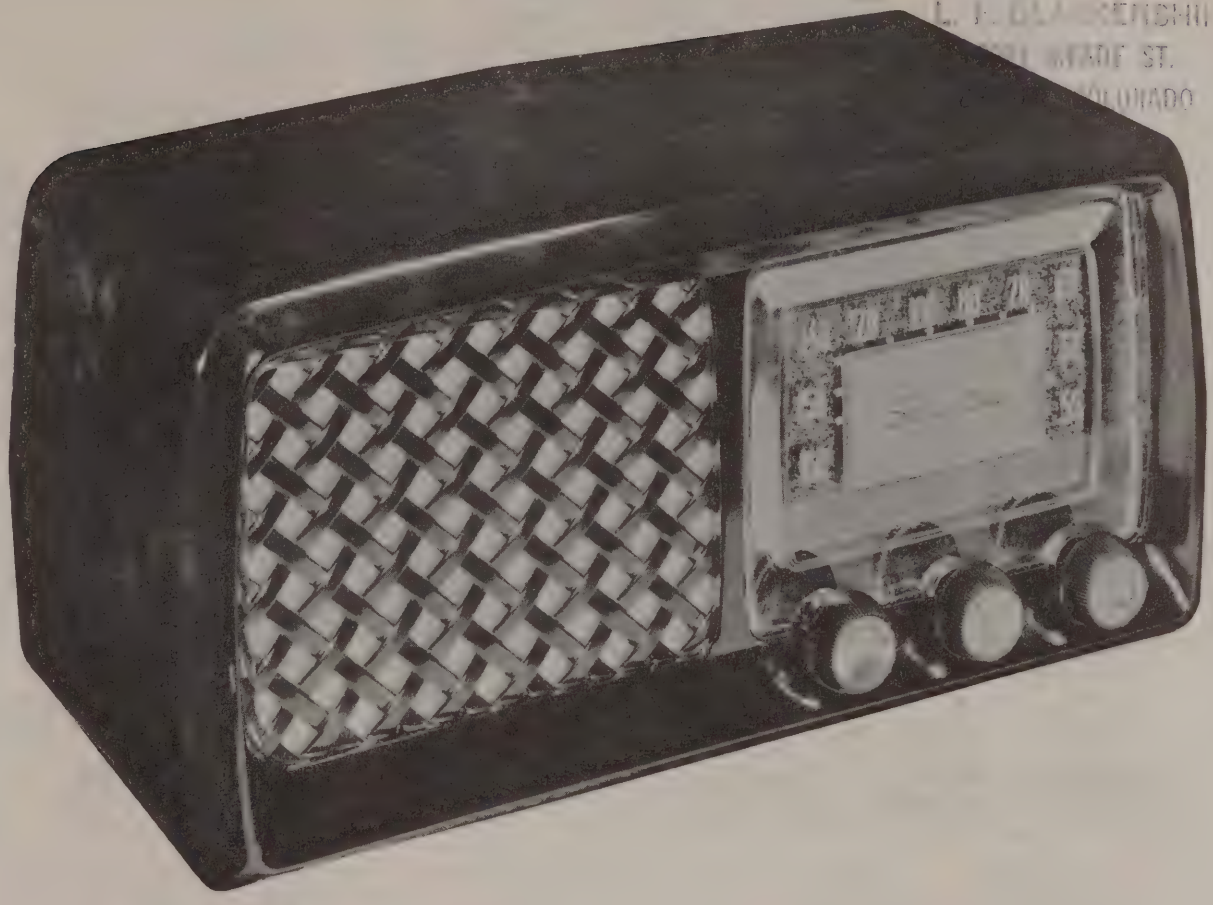
Adjust the horizontal drive control (R8) for widest picture without compression in center.

Adjust the width coil slug (B1) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity control slug (B2) for a picture that is symmetrical from left to right.

SILVERTONE MODELS 2014, 2015, 2016, 6014, 6015, 6016 (Ch. 132.40500)

SILVERTONE MODELS 2014, 2015, 2016, 6014, 6015, 6016 (Ch. 132.40500)



SILVERTONE MODELS 2014, 2015, 2016, 6014, 6015, 6016 (Ch. 132.40500)

TRADE NAME	Silvertone Models 2014, 2015, 2016, 6014, 6015 , 6016 (Ch. 132. 40500)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Six)	Types 12BD6 RF Amplifier, 12BE6 Converter, 12BD6 IF Amplifier, 12AT6 Det.-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING .27 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	50MMF	External antenna connection	1400KC	Tune to 1400KC signal	"	A5, A6, A7	"

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PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 2014 (Ch. 132.40500)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BD6	
V2	Converter	12BE6	
V3	IF Amplifier	12BD6	
V4	Det.-AVC-AF Amp.	12AT6	
V5	Output	35C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	N24249	PRS150V4080	BBRD8415	TCD498	TDLD12	FMT-1540	TVA-3455
B	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200		BPD-05	DF503	CUB2S47		PT4147	2TM-S47	
C3	50	500		NPO-D150	TCZ-50	Z034	NPO-338-500	ZT-545	5TCC-Q5	
C4	220			SI-220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C5	.001	600		BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C6	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C7	220			SI-220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C8	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C9	.0033	600		BPD-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C10	.01	400		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C11	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C12	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½	N25699	BTSK-67-S	A47F3-500K	Q13-133X	UT-430	Volume-Tapped at 150KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R1A.
R2A	500KΩ	½	N25700	BSK-60	A47-500K-Z	Q13-133	U-48	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

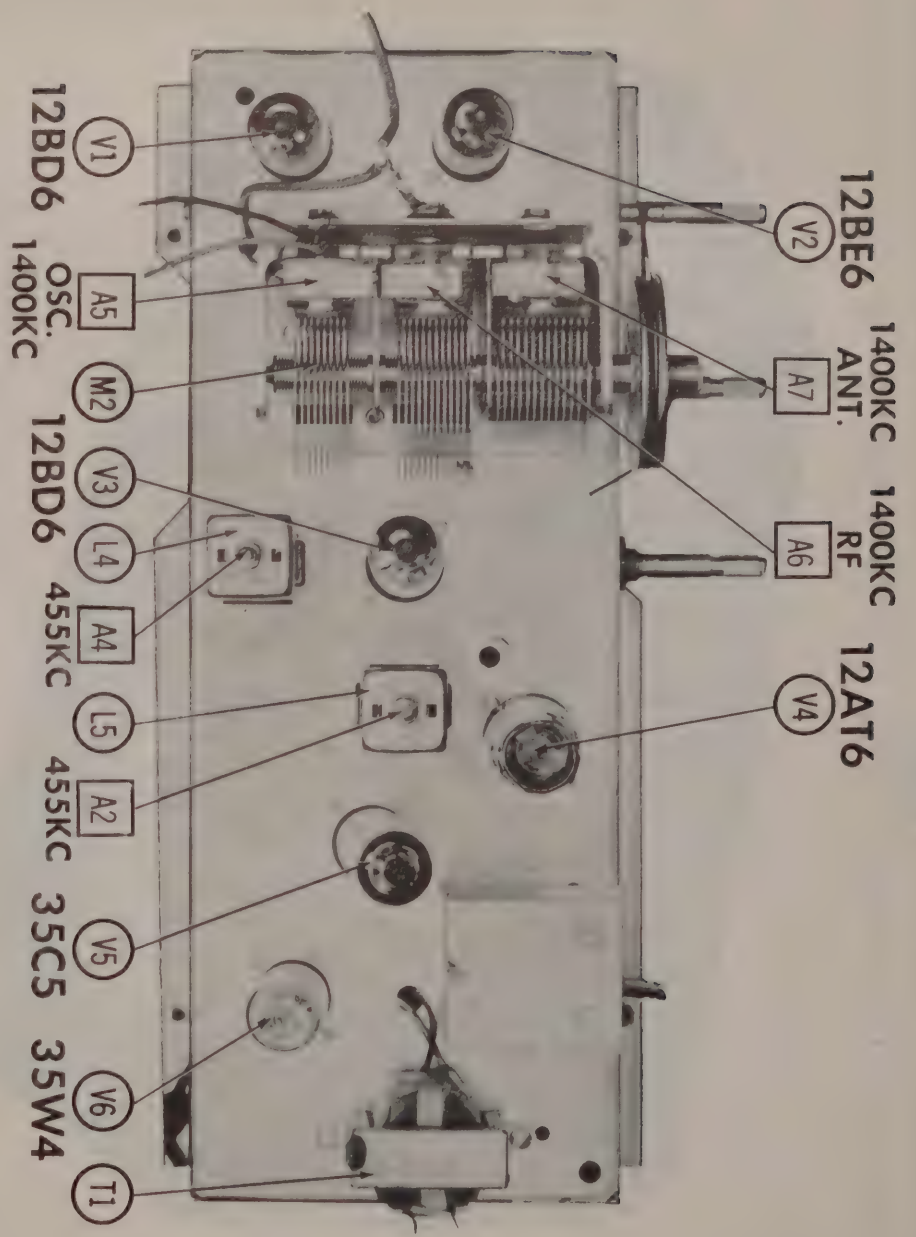
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R3	6.8Meg			BTS-6.8Meg	
R4	22KΩ			BTS-22K	
R5	2200Ω			BTS-2200	
R6	68Ω			BTS-68	
R7	1Meg			BTS-1Meg	
R8	33KΩ			BTS-33K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R9	10Meg			BTS-10Meg	
R10	330KΩ			BTS-330K	
R11	150Ω			BTS-150	
R12	1000Ω	2		BTB-1000	
R13	150Ω			BTS-150	
R14	330KΩ			BTS-330K	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.7KΩ	3-4Ω	42700-5	Z1101	A-3025	A-3332	26858	S-12X	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5"	PM	3-4Ω	25756	5A07	205S2	

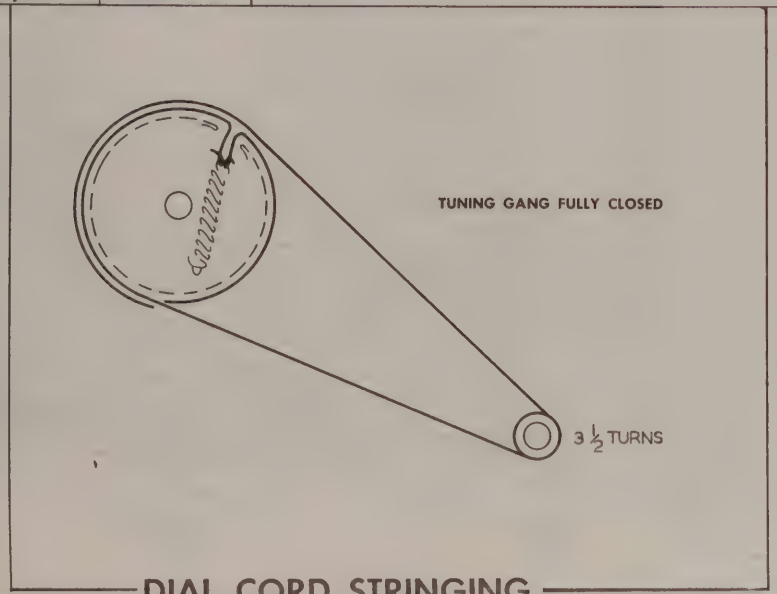
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	0Ω	.5Ω	N25657-3				
L2	RF Coil	2.1Ω	8.5Ω	N25706-1	14-1072	BC-382 *	70-RF	
L3	Osc. Coil	.6Ω	6.7Ω	N23751-1	14-1074		70-Osc.	
L4	Input IF	15Ω	15Ω	N43412-1	16-6758	BC-352	12-C1	
L5	Output IF	15Ω	15Ω	N43412-1	16-6758	BC-353	12-C2	

* Drill mounting hole.

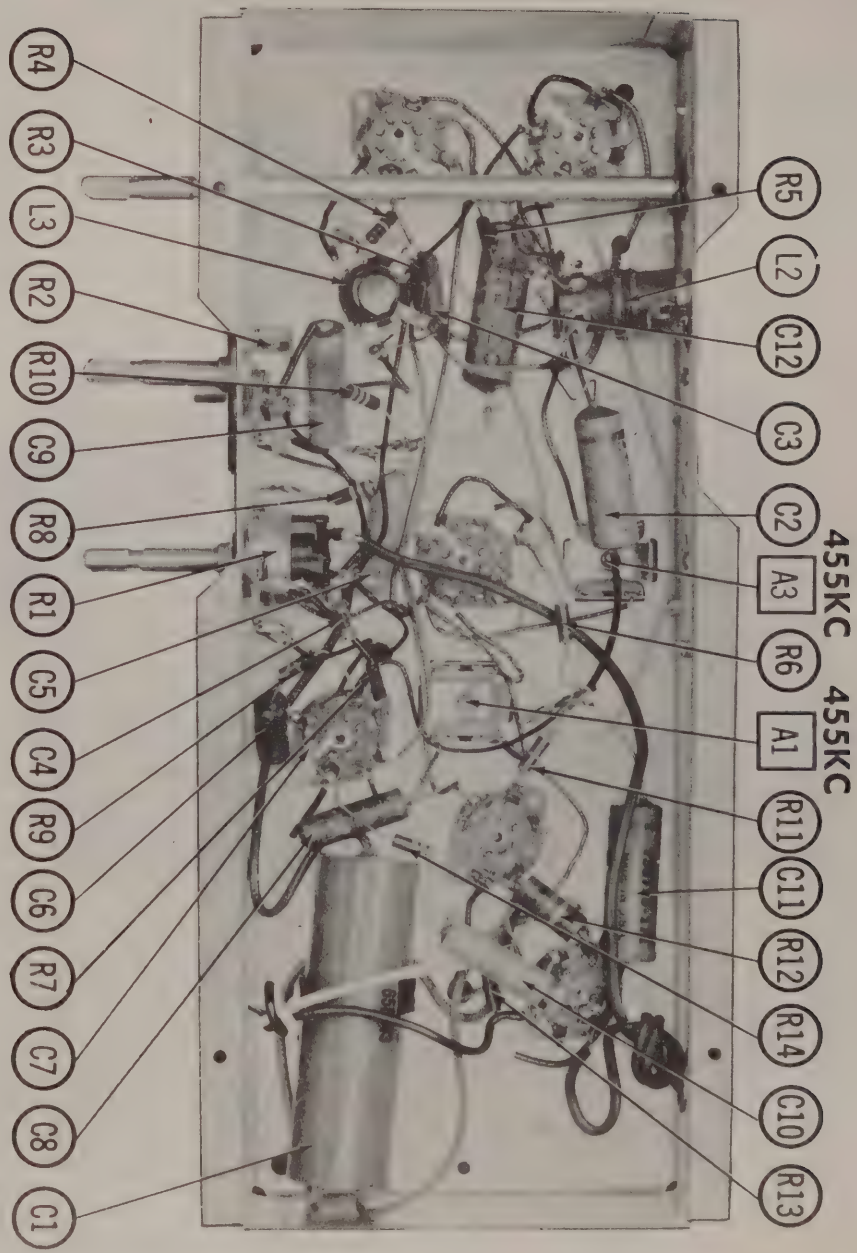
MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Dial Light	N19351	#47
M2	Tuning Cap.	N43541	3 Gang (30-290MMF, 40-400MMF, 23-185MMF)
	Cabinet	N25720-1	Models 2015, 6015
	Cabinet	N25721-1	Models 2016, 6016
	Cabinet	N25722-1	Models 2014, 6014
	Knob	N25636-1	On-Off-Volume, Models 2015, 6015
	Knob	N25636-4	On-Off-Volume, Models 2014, 2016, 6014
	Knob	N25636-2	Tone, Models 2015, 6015
	Knob	N25636-5	Tone, Models 2014, 2016, 6014, 6016
	Knob	N25636-3	Tuning, Models 2015, 6015
	Knob	N25636-6	Tuning, Models 2014, 2016, 6014, 6016
	Dial Crystal	N25641	



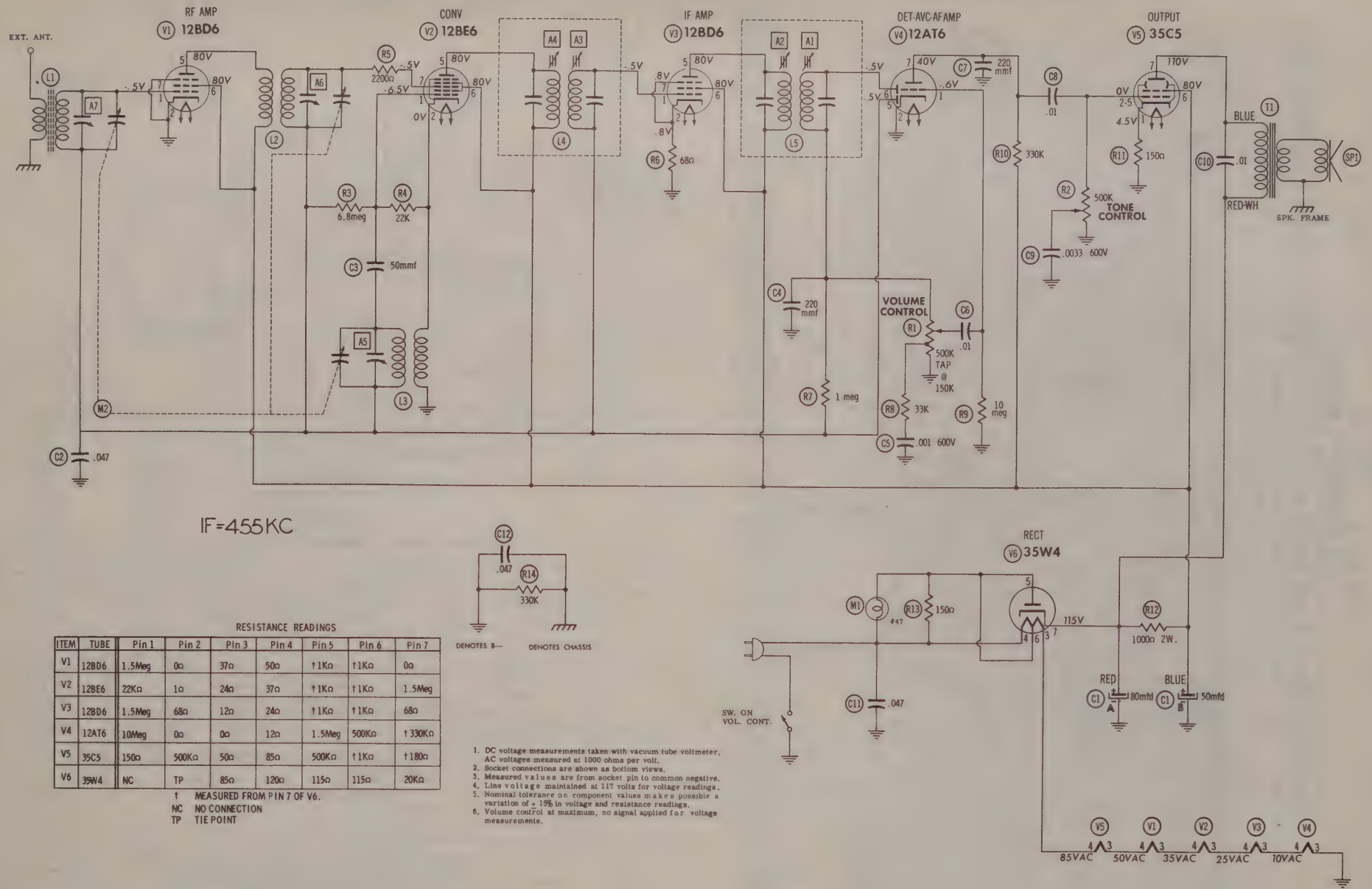
DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



SILVERTONE
MODEL 2014 (Ch. 132. 40500)

SILVERTONE
MODEL 2014 (Ch. 132. 40500)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BD6	1.5Meg	0Ω	37Ω	50Ω	†1KΩ	†1KΩ	0Ω
V2	12BE6	22KΩ	1Ω	24Ω	37Ω	†1KΩ	†1KΩ	1.5Meg
V3	12BD6	1.5Meg	68Ω	12Ω	24Ω	†1KΩ	†1KΩ	68Ω
V4	12AT6	10Meg	0Ω	0Ω	12Ω	1.5Meg	500KΩ	†330KΩ
V5	35C5	150Ω	500KΩ	50Ω	85Ω	500KΩ	†1KΩ	†180Ω
V6	35W4	NC	TP	85Ω	120Ω	115Ω	115Ω	20KΩ

† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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ZENITH MODEL
Royal 500 (Ch. 7XT40)

ZENITH MODEL
Royal 500 (Ch. 7XT40)

TRADE NAME	Zenith Model Royal 500 (Ch. 7XT40)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.
TYPE SET	Battery Operated Portable Transistorized AM Superheterodyne Receiver
POWER SUPPLY	6 Volts "A" Supply — RATING 10MA @ 6 Volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Direct	Loop	455KC (400~ Mod.)	600KC	Across Voice Coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	"	1620KC	Tuning gang fully open	"	A4	"
3.	"	"	1260KC	Tune to 1260KC signal	"	A5	"
4.	"	"	535KC	Tuning gang fully closed	"	A6	"

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PARTS LIST AND DESCRIPTIONS

ZENITH
MODEL Royal 500 (Ch. 7XT40)

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Mixer (Zenith #121-6)	2N94	
X2	Osc. (Zenith #121-6)	2N94	
X3	1st IF Amp. (Zenith #121-6)	2N94	
X4	2nd IF Amp. (Zenith #121-6)	2N94	
X5	Driver (Zenith # 121-7)	2N35	
X6	Output (Zenith #121-8)	2N35	Note 1
X7	Output (Zenith #121-8)	2N35	Note 1

Note 1. Transistors X6 and X7 (Zenith Part No. 121-8) are a matched pair.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	6	22-2726	SRE6V50	EC50-6		ML50-6		TE-1100
C2	3	6	22-2724	XPP6V3	EC3-6	TAW8A3	ML4-6		TE-1087
C3	3	6	22-2724	XPP6V3	EC3-6	TAW8A3	ML4-6		TE-1087
C4	40	3	22-2725	XPP3V40	EC40-3	TAP6-30			TE-1057

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	50000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C6	1000									
C7	50000									
C8	50000									
C9	50000									
C10	50000									
C11	50000									
C12	11									
C13	50000									
C14	50000									
C15	11									
C16	50000									
C17	50000									
C18	50000									
C19	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C20	50000									
C21	50000									

Note 1. When C20 is .1MFD, C21 is not used.

CONTROLS

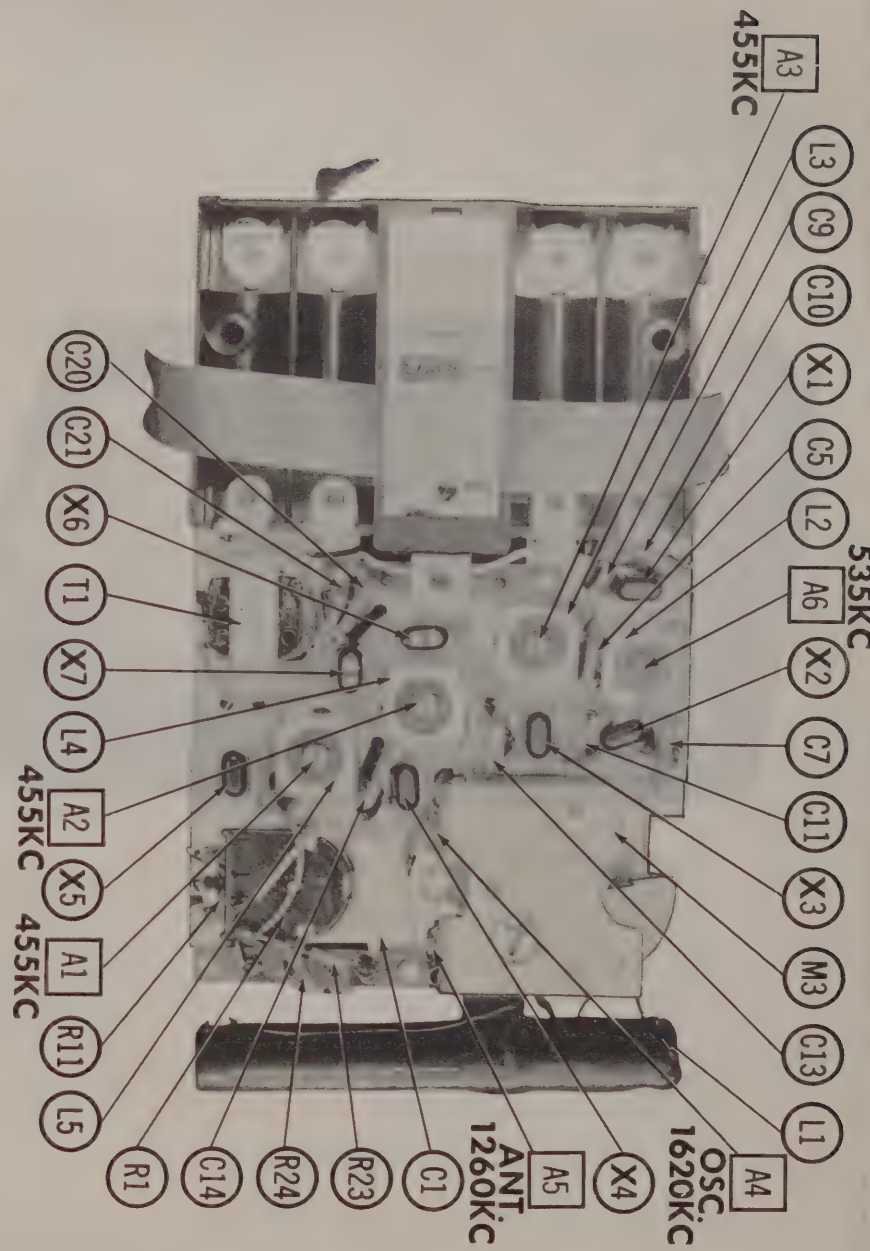
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2000Ω	½	63-3603					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R2	1000Ω		63-3786	BTR-1000	
R3	470Ω		63-3772	BTR-470	
R4	10KΩ		63-3827	BTR-10K	
R5	4700Ω		63-3813	BTR-4700	
R6	1000Ω		63-3786	BTR-1000	
R7	1000Ω		63-3786	BTR-1000	
R8	100KΩ		63-3869	BTR-100K	
R9	10Ω		63-3701	BTR-10	
R10	560Ω		63-3775	BTR-560	
R11	15KΩ		63-3834	BTR-15K	
R12	3900Ω		63-3810	BTR-3900	
R13	1000Ω		63-3786	BTR-1000	
R14	470Ω		63-3772	BTR-470	
R15	100KΩ		63-3869	BTR-100K	
R16	15KΩ		63-3834	BTR-15K	
R17	3900Ω		63-3810	BTR-3900	
R18	1000Ω		63-3786	BTR-1000	
R19	470Ω		63-3772	BTR-470	
R20	18KΩ		63-3838	BTR-18K	
R21	220Ω		63-3758	BTR-220	
R22	2200Ω		63-3799	BTR-2200	
R23	100Ω		63-3744	BTR-100	
R24	4700Ω		63-3813	BTR-4700	
R25	120Ω		63-3747	BTR-120	
R26	10Ω		63-3701	BTR-10	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO DRIVER)

ITEM No.	RESISTANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	410Ω	235Ω CT	95-1463						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	600Ω	14Ω	95-1462				TR-20		

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	RCA TYPE No.	
SP1	2 3/4"	PM	14Ω	49-788		222S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	3Ω	1.9Ω	S-23762	14-9005			
L2	Osc. Coil	7Ω		95-1461	14-9006			Tapped ② .2Ω, .4Ω, and 1.5Ω
L3	1st IF Trans.	2.4Ω*	.6Ω	95-1459	16-9003			* Tapped ② 1.3Ω
L4	2nd IF Trans.	2.9Ω■	.6Ω	95-1459	16-9003			■ Tapped ② 1.3Ω
L5	3rd IF Trans.	2.4Ω▲	1Ω	95-1460	16-9004			▲ Tapped ② 1.3Ω

BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1.5V	Z8 or Z9 (Mercury Type)	915 or E502E (Mercury Type)			Z			Connect 4 in series. Connect 4 in series.

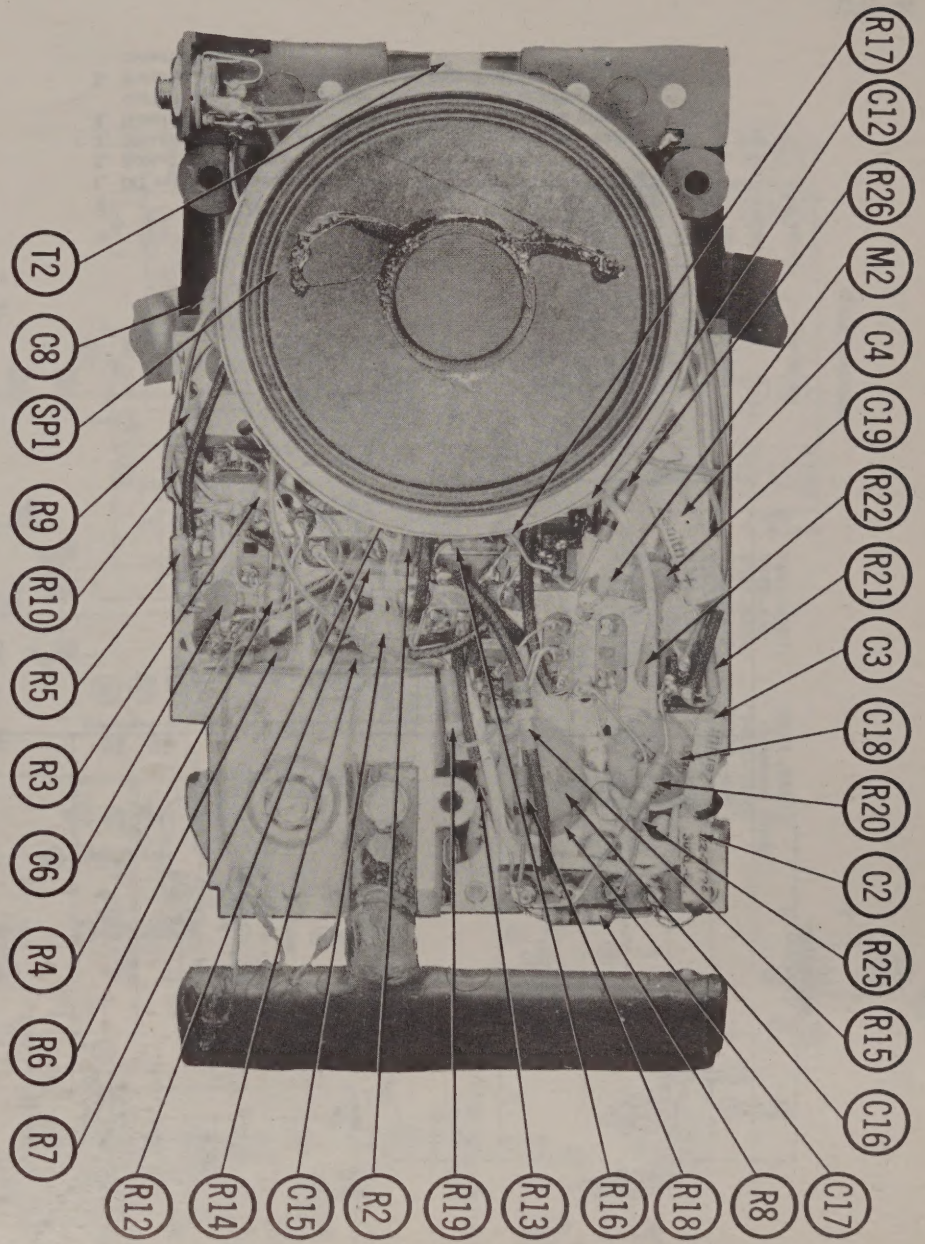
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		ZENITH PART No.	SYLVANIA PART No.	
M2	1N295	103-18	1N60	Audio Det. (Pigtail)

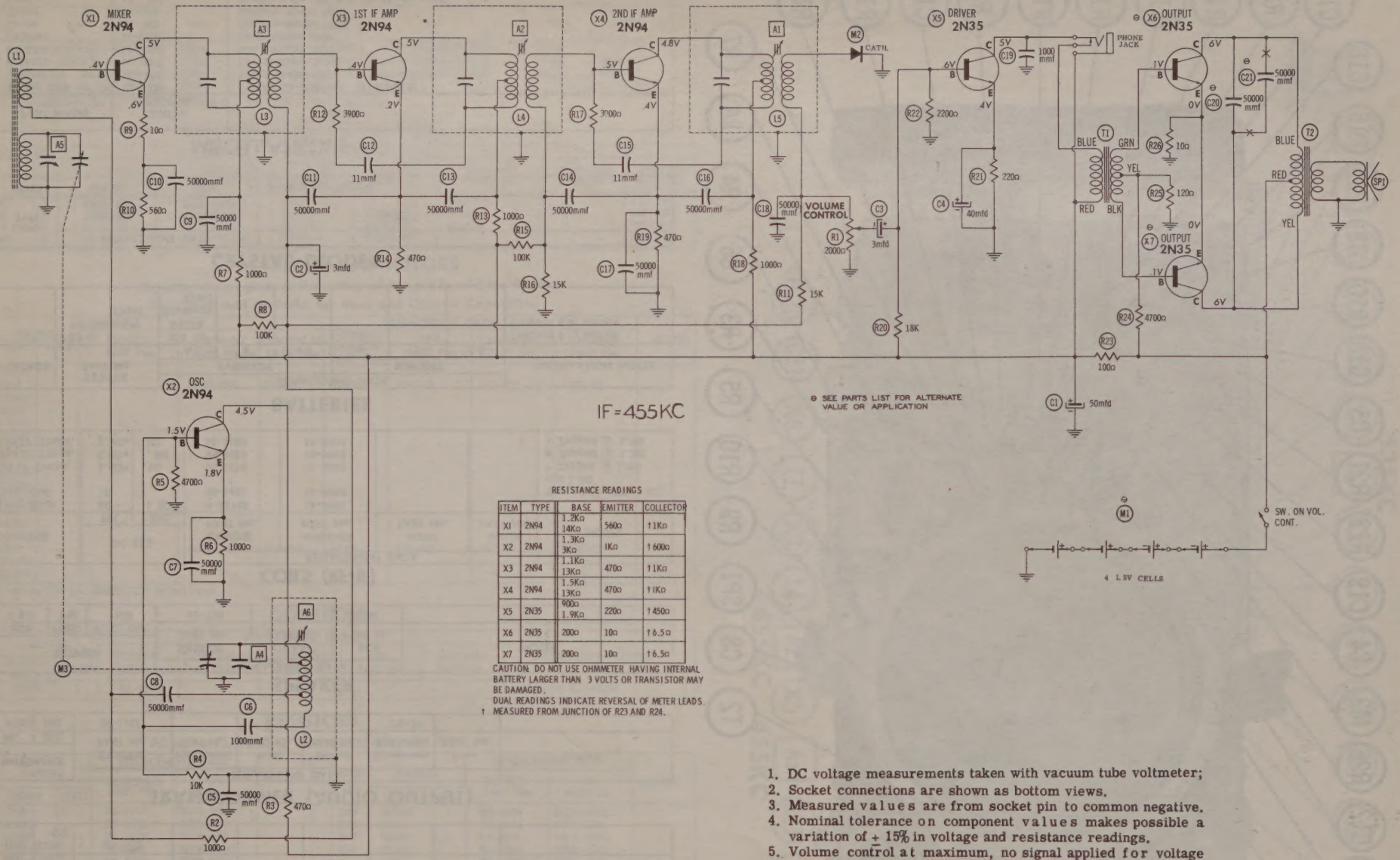
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuning Cap.	22-2723	2 Gang (13-135MMF, 12-90MMF)
	Cabinet	14-1924	Front-Model 500Y
	Cabinet	14-1925	Front-Model 500R
	Cabinet	14-1929	Rear-Model 500Y
	Cabinet	14-1930	Rear-Model 500R
	Cover	24-788	Battery-Model 500Y
	Cover	24-789	Battery-Model 500R
	Knob	46-1422	Tuning & On-Off-Volume-Model 500Y
	Knob	46-1423	Tuning & On-Off-Volume-Model 500R

CHASSIS—BOTTOM VIEW



ZENITH
MODEL Royal 500 (Ch. 7XT40)



RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N94	1.2KΩ 14KΩ	560Ω	†1KΩ
X2	2N94	1.3KΩ 3KΩ	1KΩ	†600Ω
X3	2N94	1.1KΩ 13KΩ	470Ω	†1KΩ
X4	2N94	1.5KΩ 13KΩ	470Ω	†1KΩ
X5	2N35	900Ω 1.9KΩ	220Ω	†450Ω
X6	2N35	200Ω	10Ω	†6.5Ω
X7	2N35	200Ω	10Ω	†6.5Ω

CAUTION: DO NOT USE OHMMETER HAVING INTERNAL BATTERY LARGER THAN 3 VOLTS OR TRANSISTOR MAY BE DAMAGED.
DUAL READINGS INDICATE REVERSAL OF METER LEADS.
† MEASURED FROM JUNCTION OF R23 AND R24.

1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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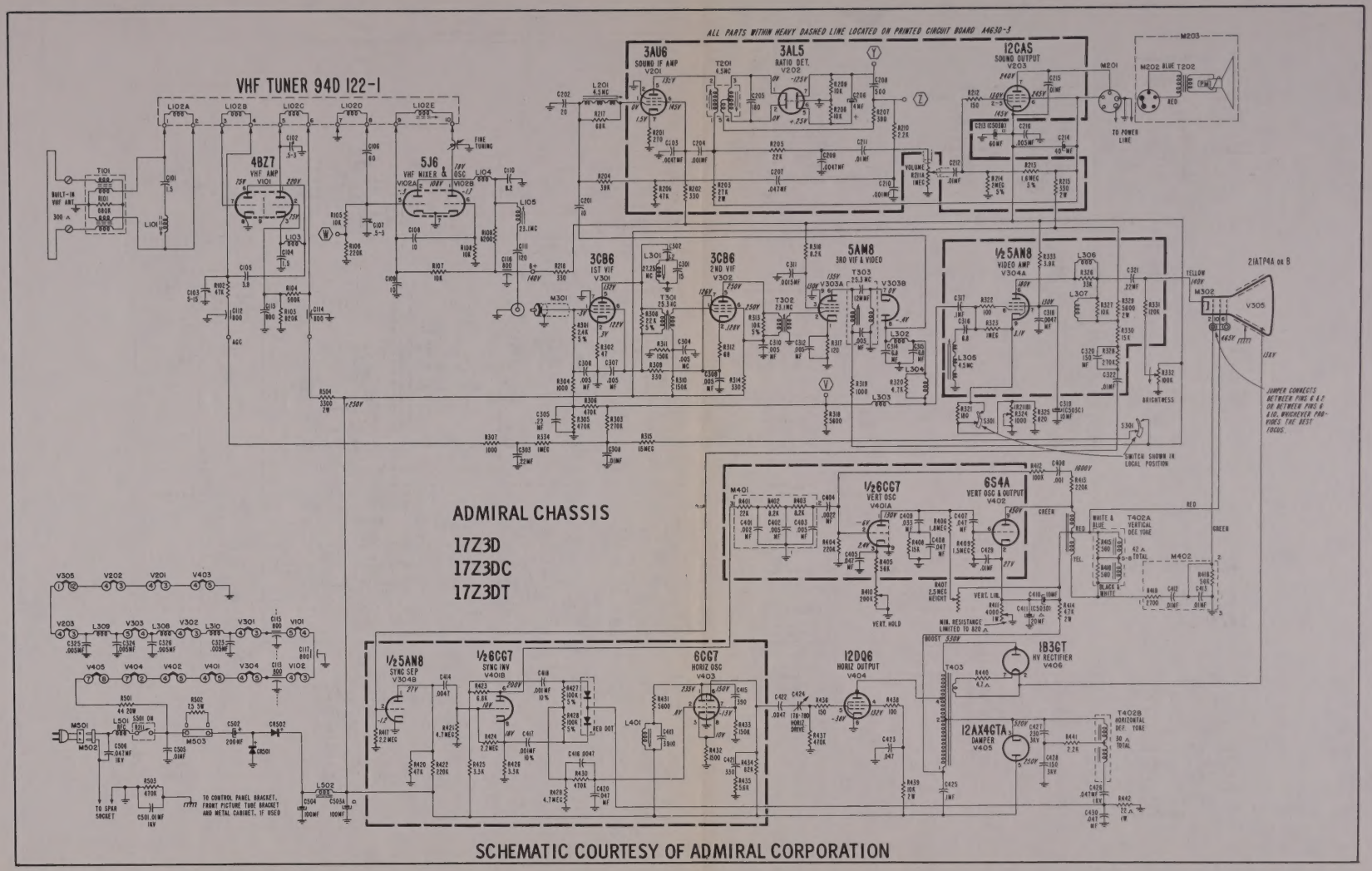
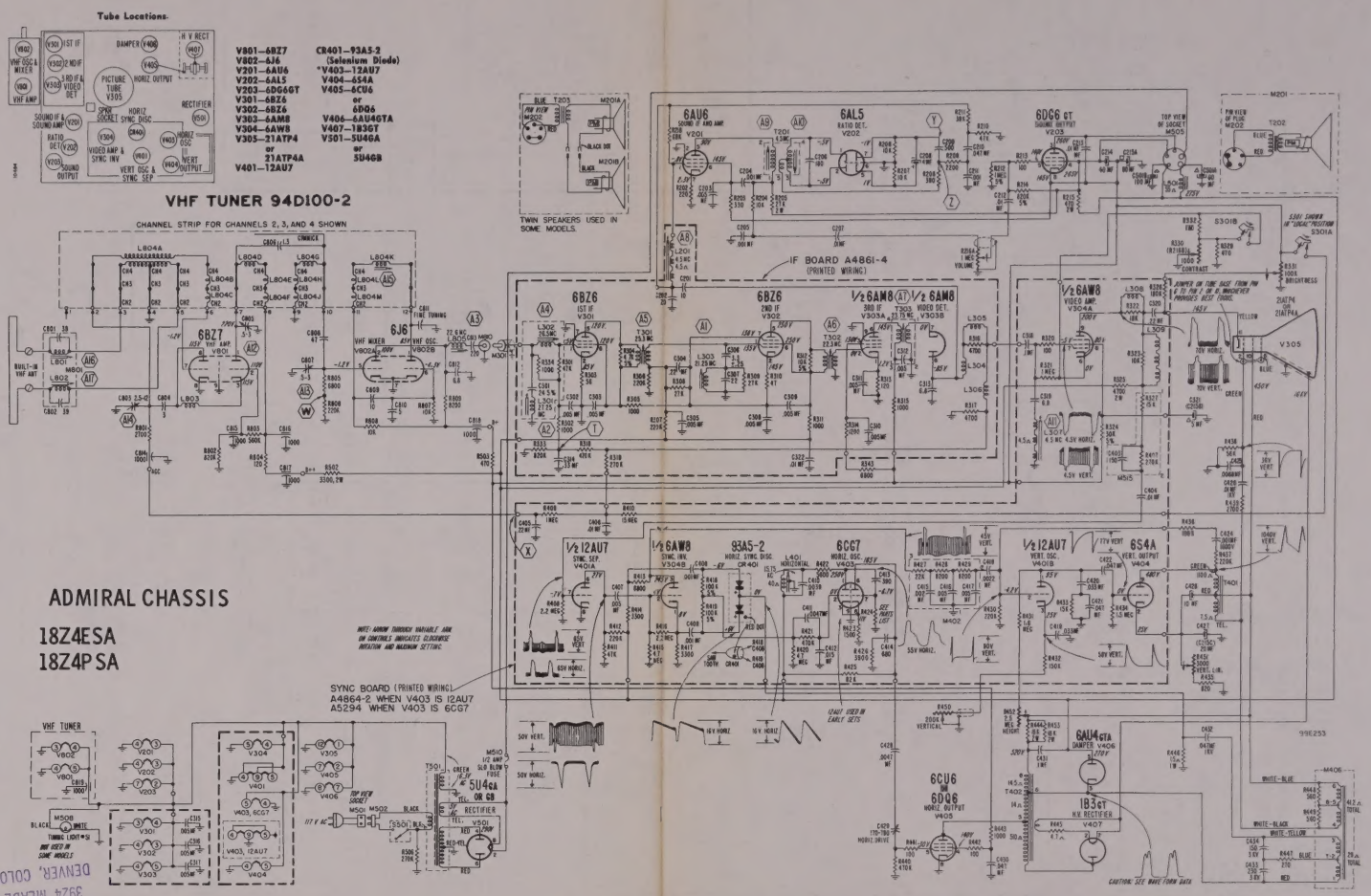

ALL PARTS WITHIN HEAVY DASHED LINE LOCATED ON PRINTED CIRCUIT BOARD A4630-3
VHF TUNER 94D 122-1
3AU6 SOUND IF AMP V201
3AL5 RATIO DET. V202
12CAS SOUND OUTPUT V203
4BZ7 VHF AMP V101
5J6 VHF MIXER & OSC V102A V102B
3CB6 1ST VIF V301
3CB6 2ND VIF V302
5AM8 3RD VIF & VIDEO V303
½5AN8 VIDEO AMP V304A
21ATP4A or B
½6CG7 VERT OSC V401A
6S4A VERT OSC & OUTPUT V402
½5AN8 SYNC SEP V304B
½6CG7 SYNC INV V401B
6CG7 HORIZ OSC V403
12DQ6 HORIZ OUTPUT V404
1B3GT HV RECTIFIER V406
12AX4GTA DAMPER V405
ADMIRAL CHASSIS
17Z3D
17Z3DC
17Z3DT
SCHEMATIC COURTESY OF ADMIRAL CORPORATION



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